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TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS,

FOR THE YEAR

1866 ;

ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.

COMPUTED BY JOHN BURDWOOD, STAFF COMMANDER, R.N.

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PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.  
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1865.

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N O T I C E.

If it be desired to reduce the Mean Time at any Place to that of Greenwich (or Railway) Time, (which latter is used in the Tide Tables, published in Liverpool and Glasgow,) the following correction must be applied to the Time given in these Tables :—

				Minutes.
Brest	-	-	-	+ 18
Devonport	-	-	-	+ 17
Portsmouth	-	-	-	+ 4
Dover	-	-	-	— 5
Sheerness	-	-	-	— 3
Harwich	-	-	-	— 5
Hull	-	-	-	+ 1
Sunderland	-	-	-	+ 5
North Shields	-	-	-	+ 6
Leith	-	-	-	+ 13
Thurso	-	-	-	+ 14
Greenock	-	-	-	+ 19
Liverpool	-	-	-	+ 12
Pembroke	-	-	-	+ 20
Weston-super-mare	-	-	-	+ 12
Holyhead	-	-	-	+ 18

For the Irish Ports, should Dublin Mean Time be required, the following correction must be applied to the time given in these Tables :—

				Minutes.
Kingstown	-	-	-	— 1
Belfast	-	-	-	— 2
Londonderry	-	-	-	+ 4
Sligo	-	-	-	+ 9
Galway	-	-	-	+ 11
Queenstown (Cork)	-	-	-	+ 8
Waterford	-	-	-	+ 3

The above corrections are also given at the foot of each page under the place for which the times and heights of high water are predicted.

ADVERTISEMENT.

In the following Tables the time of High Water is given to *Mean* time at Place. Those who are desirous of knowing the *Apparent* time, (or that shown by the Sun,) at which High Water occurs, must apply the equation of time, by addition or subtraction, as directed for that purpose.

The height of the tide in these Tables is calculated from the mean level of the low water of ordinary springs, because the soundings expressed in most charts are reduced to that level. The height therefore which is given at each place is the actual rise of high water above the mean low-water level of spring-tides.

In the column of the Moon's transit, (m) stands for morning, and (a) for afternoon.

The Moon's age is given in days, and tenths of a day, from the time of her conjunction, or change; thus, it is New Moon on the 16th of March, at 9 h. 37 m. in the afternoon, and therefore, on the 17th of March, at noon, the moon being 14 h. 23 m. old, her age may be accounted as six tenths of a day, and is expressed by 0.6.

The highest equinoctial tides take place, on the west coast of Ireland and on the south coast of England, three transits after the New and Full Moon, unless diverted by gales of wind or other extraordinary causes. Along the east coast of England, they take place four transits after the New and Full Moon. In the river Thames they occur five transits after the same epoch. These differences arise from the cause, that the same tide-wave which produces high water on the west coast of Ireland takes half a day in its progress from thence to the east coast of England, and a whole day before it arrives in the river Thames.

The time of high water at Brest is added for the benefit of vessels navigating the north coast of France and the adjacent sea.

Immediately after the Tide Tables, at page 98, will be found a convenient method of deducing, from them, the height of the tide at any intermediate hour, between high and low water.

At page 100 are shown the depths on the dock-sills at Falmouth, Devonport, Plymouth, Portsmouth, Sheerness, Chatham, Woolwich, Deptford, London, Hull, Middlesbrough, Hartlepool, Sunderland, Newcastle-upon-Tyne, Leith, Cardiff, Pembroke, Liverpool, Birkenhead, Dublin, and Londonderry.

At page 103 will be found a collection of Constant Differences, by which the time and height of high water at certain other ports may be approximately found.

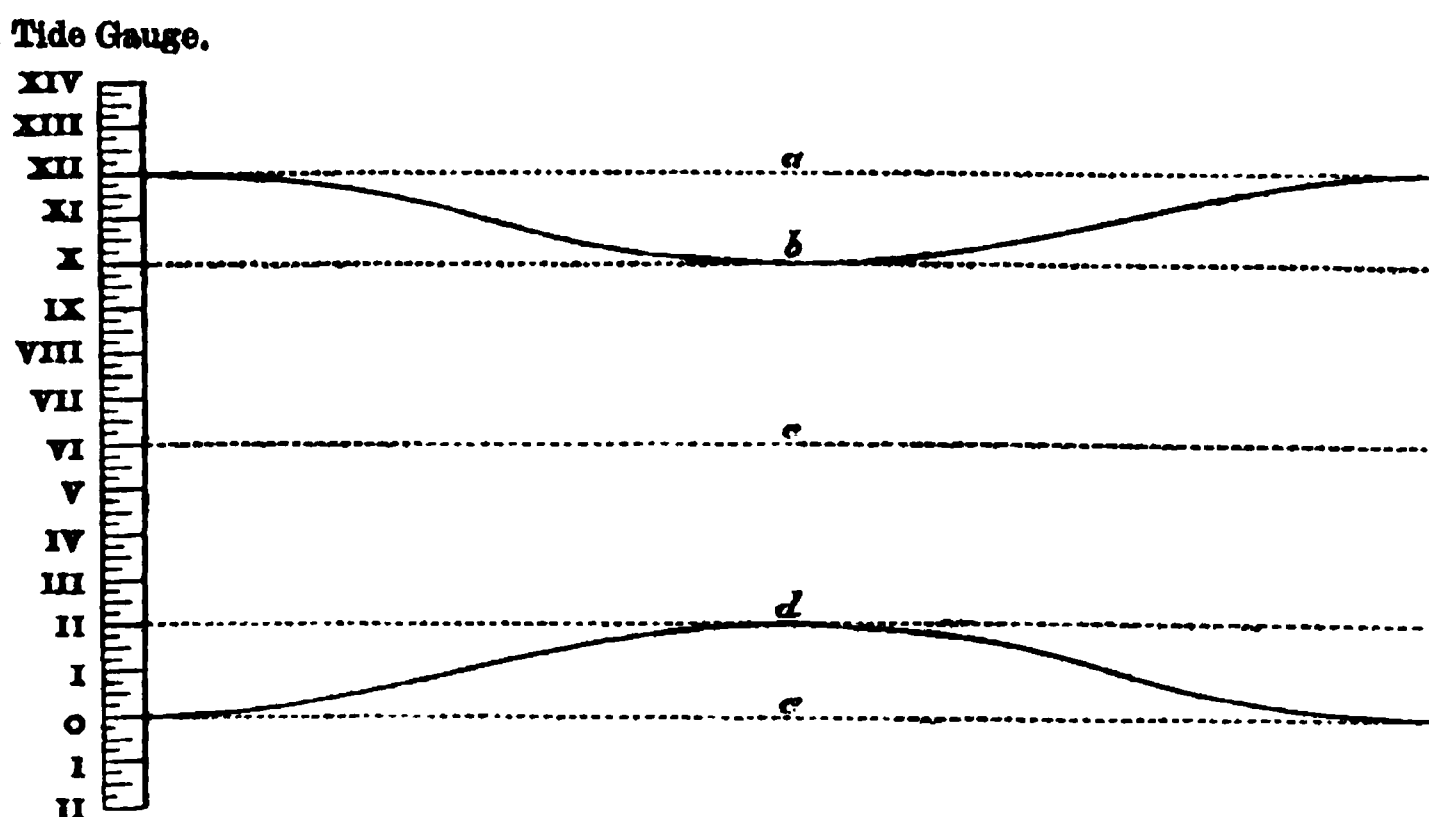
At page 108 a description is given of the general set of the tides in the neighbourhood of several parts of the coast, including a full account of the streams among the Orkneys, and through the Pentland Firth, by Captain F. W. L. Thomas, R. N. And, the development, by Rear-Admiral F. W. Beechey, of the movement of the great tide-wave up the English and Irish Channels, and into the North Sea; to which has been added a description of the set of the tides in the vicinity of Rathlin Island on the north coast of Ireland by Richard Hoskyn, Staff Commander, R. N.

Lastly, there is appended the time of high water on the days of Full and Change at various places on the globe arranged according to the apparent progress of the tide-wave, and also alphabetically; with the rise of the tide at springs and neaps.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge, the latter being given in these tables, by applying to the times at the docks $+10^m$ and to the heights -4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland, North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke, Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown, Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Mullaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Duncannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise, and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

	ft.
Spring Rise (or Mean Spring Range) = e to a	= 12
Neap Rise - - - = e to b	= 10
Neap Range - - - = d to b	= 8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1866.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	morn.	3 25	19 3	3 49	19 5	5 19	15 8	5 44	15 5	11 22	12 9	11 45	12 10
Tu.	2	0 43	4 14	19 6	4 37	19 6	6 8	16 0	6 32	15 6	—	—	0 10	12 10
W.	3	1 37	4 56	19 4	5 18	19 2	6 54	16 1	7 11	15 3	0 34	12 10	0 56	12 9
Th.	4	2 27	5 38	18 10	5 57	18 7	7 30	15 9	7 50	14 11	1 18	12 7	1 40	12 6
F.	5	3 15	6 17	18 2	6 37	17 8	8 9	15 2	8 26	14 3	1 59	12 5	2 18	12 3
S.	6	4 1	6 56	17 1	7 16	16 7	8 45	14 5	8 59	13 7	2 38	12 0	2 57	12 9
S.	7	4 45	7 36	15 11	7 56	15 4	9 16	13 8	9 36	12 11	3 16	11 6	3 35	11 3
M.	8	5 28	8 16	14 9	8 39	14 2	9 55	12 10	10 15	12 3	3 54	11 0	4 13	10 9
Tu.	9	6 10	9 4	13 9	9 34	13 6	10 38	12 3	11 2	11 10	4 36	10 5	5 0	10 2
W.	10	6 54	10 6	13 3	10 42	13 3	11 31	11 9	—	—	5 28	9 11	5 58	9 10
Th.	11	7 39	11 19	13 3	11 57	13 5	0 5	11 9	0 42	11 10	6 32	9 9	7 8	9 9
F.	12	8 25	—	—	0 33	13 9	1 18	12 0	1 54	12 1	7 45	9 11	8 21	10 2
S.	13	9 14	1 5	14 3	1 32	14 9	2 30	12 6	3 0	12 8	8 55	10 5	9 23	10 8
S.	14	10 4	1 56	15 3	2 18	15 11	3 30	13 3	3 56	13 4	9 48	11 0	10 12	11 3
M.	15	10 55	2 39	16 7	2 58	17 2	4 22	14 1	4 46	14 0	10 34	11 6	10 54	11 9
Tu.	16	11 48	3 18	17 9	3 38	18 2	5 9	14 9	5 30	14 6	11 14	12 0	11 34	12 2
W.	17	0 40	3 57	18 7	4 17	18 11	5 51	15 3	6 12	14 11	11 53	12 5	—	—
Th.	18	1 32	4 37	19 1	4 56	19 3	6 32	15 8	6 52	15 2	0 13	12 7	0 34	12 8
F.	19	2 23	5 16	19 5	5 36	19 4	7 11	15 10	7 30	15 2	0 55	12 8	1 16	12 9
S.	20	3 14	5 55	19 3	6 15	19 1	7 50	15 9	8 10	15 0	1 36	12 9	1 56	12 9
S.	21	4 5	6 36	18 10	6 58	18 4	8 32	15 4	8 52	14 9	2 16	12 8	2 37	12 7
M.	22	4 57	7 21	17 10	7 46	17 3	9 11	14 11	9 32	14 4	2 59	12 4	3 22	12 2
Tu.	23	5 50	8 11	16 7	8 37	16 0	9 56	14 3	10 21	13 9	3 46	11 11	4 10	11 8
W.	24	6 44	9 6	15 5	9 39	15 0	10 49	13 7	11 18	13 3	4 34	11 4	5 2	11 0
Th.	25	7 40	10 18	14 10	11 0	14 9	11 52	13 0	—	—	5 33	10 8	6 10	10 6
F.	26	8 37	11 43	14 10	—	—	0 32	12 11	1 13	13 0	6 49	10 5	7 31	10 7
S.	27	9 34	0 24	15 2	1 1	15 7	1 53	13 3	2 32	13 3	8 11	10 10	8 51	11 1
S.	28	10 30	1 36	16 2	2 5	16 11	3 8	13 11	3 43	13 11	9 28	11 5	10 1	11 9
M.	29	11 24	2 31	17 6	2 54	18 1	4 14	14 8	4 41	14 6	10 27	12 0	10 50	12 3
Tu.	30	morn.	3 17	18 7	3 39	18 11	5 7	15 3	5 32	15 0	11 13	12 5	11 35	12 7
W.	31	0 16	3 59	19 2	4 20	19 3	5 54	15 8	6 16	15 2	11 55	12 8	—	—

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - - -	1	6	48	Morning.
Last Quarter -	8	9	37	Afternoon.
New - - - - -	16	8	37	Afternoon.
First Quarter -	23	8	54	Afternoon.
Full - - - - -	30	8	29	Afternoon.
In Apogee - -	9	11	0	Afternoon.
In Perigee - -	23	10	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	N.46	9	9	S. 7	17	14	S.25	25	16	N. 7
2	15	49	10	12	15	18	11	14	26	17	54
3	13	1	11	14	53	19	7	25	27	18	36
4	9	38	12	16	55	20	3	9	28	18	9
5	5	54	13	18	13	21	1	N.18	29	16	39
6	2	1	14	18	41	22	5	42	30	14	14
7	1	S.52	15	18	12	23	9	48	31	11	7
8	5	37	16	16	46	24	13	21			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.			
M.	1	10 50 18 9	11 17 18 11	0 9 15 11	0 34 16 1	1 38 18 7	2 4 18 11	D.	0					
Tu.	2	11 43 19 0	—	0 59 16 3	1 22 16 5	2 31 19 2	2 53 19 4	15.3						
W.	3	0 8 19 0	0 31 18 11	1 46 16 5	2 8 16 4	3 15 19 5	3 35 19 5	16.3						
Th.	4	0 53 18 9	1 16 18 7	2 28 16 3	2 48 16 1	3 57 19 4	4 18 19 3	17.3						
F.	5	1 37 18 5	1 58 18 2	3 8 15 11	3 27 15 9	4 40 19 1	4 58 18 11	18.3						
S.	6	2 18 17 9	2 38 17 5	3 47 15 5	4 7 15 2	5 19 18 8	5 38 18 4	19.3						
S.	7	2 58 17 0	3 17 16 6	4 26 14 10	4 46 14 6	5 57 18 1	6 17 17 9	20.3						
M.	8	3 35 16 1	3 54 15 7	5 6 14 2	5 27 13 11	6 37 17 4	6 57 17 0							
Tu.	9	4 16 15 2	4 39 14 8	5 49 13 7	6 14 13 4	7 19 16 8	7 42 16 4	22.3						
W.	10	5 4 14 4	5 31 14 1	6 42 13 0	7 14 12 10	8 10 16 0	8 42 15 10	23.3						
Th.	11	6 2 13 11	6 34 14 0	7 47 12 10	8 23 12 10	9 16 15 8	9 49 15 6	24.3						
F.	12	7 10 14 3	7 47 14 7	8 59 12 11	9 35 13 2	10 24 15 6	11 2 15 8	25.3						
S.	13	8 20 15 0	8 48 15 4	10 10 13 5	10 41 13 8	11 37 15 9	—	26.3						
S.	14	9 12 15 9	9 35 16 3	11 7 13 11	11 30 14 3	0 9 16 1	0 34 16 4	27.3						
M.	15	9 58 16 8	10 20 17 1	11 51 14 7	—	0 57 16 8	1 19 17 1	28.3						
Tu.	16	10 42 17 6	11 3 17 11	0 11 14 10	0 31 15 2	1 42 17 5	2 1 17 9							
W.	17	11 25 18 2	11 47 18 5	0 51 15 5	1 11 15 8	2 21 18 1	2 42 18 5	0.6						
Th.	18	—	0 8 18 8	1 30 15 10	1 50 16 0	3 2 18 9	3 20 19 0	1.6						
F.	19	0 29 18 10	0 51 19 0	2 9 16 1	2 27 16 2	3 39 19 2	3 57 19 4	2.6						
S.	20	1 13 19 0	1 35 18 11	2 46 16 3	3 6 16 3	4 16 19 5	4 36 19 5	3.6						
S.	21	1 56 18 10	2 17 18 8	3 25 16 1	3 45 16 0	4 56 19 4	5 17 19 3	4.6						
M.	22	2 40 18 5	3 3 18 0	4 6 15 10	4 28 15 7	5 38 19 1	5 59 18 10	5.6						
Tu.	23	3 27 17 7	3 51 17 1	4 51 15 3	5 16 14 11	6 23 18 6	6 48 18 2							
W.	24	4 15 16 7	4 41 16 1	5 43 14 7	6 11 14 3	7 13 17 10	7 39 17 5	7.6						
Th.	25	5 10 15 7	5 42 15 3	6 42 14 0	7 19 13 8	8 10 17 1	8 48 16 9	8.6						
F.	26	6 18 15 2	6 57 15 4	7 59 13 8	8 41 13 8	9 29 16 7	10 9 16 5	9.6						
S.	27	7 37 15 8	8 16 16 1	9 22 13 11	10 1 14 2	10 48 16 7	11 28 16 9	10.6						
S.	28	8 51 16 7	9 22 17 1	10 37 14 5	11 10 14 9	—	0 5 17 1	11.6						
M.	29	9 50 17 5	10 15 17 10	11 39 15 1	—	0 35 17 5	1 4 17 8	12.6						
Tu.	30	10 40 18 3	11 4 18 6	0 5 15 5	0 28 15 8	1 32 18 0	1 57 18 4							
W.	31	11 27 18 8	11 49 18 10	0 50 15 11	1 12 16 1	2 19 18 8	2 42 18 11	14.6						
Half Mean Spring } Range.		9ft. 4in.		8ft. 0in.		9ft. 7in.								

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 52	Sub.	9	7 26	Sub.	17	10 25	Sub.	25	12 39	Sub.
2	4 20		10	7 50		18	10 44		26	12 52	
3	4 48		11	8 14		19	11 3		27	13 4	
4	5 15		12	8 37		20	11 21		28	13 16	
5	5 42		13	9 0		21	11 38		29	13 26	
6	6 9		14	9 22		22	11 54		30	13 36	
7	6 35		15	9 44		23	12 10		31	13 45	
8	7 1		16	10 5		24	12 25				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
M.	1	morn.	11	47	11	9	—	—	—	—	6	2	20	10	6	28	21	0	2	58	14	3	3	22	14	5
Tu.	2	0 43	0	11	11	9	0	34	11	9	6	52	21	2	7	17	21	3	3	45	14	7	4	8	14	8
W.	3	1 37	0	58	11	9	1	21	11	8	7	41	21	3	8	1	21	1	4	31	14	8	4	51	14	7
Th.	4	2 27	1	42	11	7	2	3	11	6	8	22	20	11	8	43	20	8	5	12	14	5	5	33	14	2
F.	5	3 15	2	25	11	4	2	45	11	2	9	3	20	4	9	23	19	11	5	53	13	10	6	14	13	6
S.	6	4 1	3	5	11	0	3	25	10	10	9	43	19	6	10	2	19	0	6	35	13	2	6	56	12	11
S.	7	4 45	3	44	10	8	4	2	10	6	10	21	18	7	10	42	18	1	7	17	12	7	7	38	12	3
M.	8	5 28	4	21	10	3	4	41	10	11	11	5	17	7	11	30	17	2	8	0	11	11	8	22	11	7
Tu.	9	6 10	5	2	9	11	5	25	9	9	11	58	16	9	—	—	—	—	8	46	11	3	9	13	11	0
W.	10	6 54	5	50	9	8	6	20	9	7	0	27	16	4	0	58	16	0	9	45	10	10	10	17	10	8
Th.	11	7 39	6	54	9	6	7	31	9	6	1	28	15	10	1	59	15	10	10	51	10	8	11	24	10	8
F.	12	8 25	8	7	9	7	8	42	9	9	2	31	16	0	3	4	16	3	11	57	10	10	—	—	—	—
S.	13	9 14	9	17	9	11	9	48	10	1	3	38	16	9	4	10	17	2	0	30	11	2	1	0	11	6
S.	14	10 4	10	15	10	3	10	40	10	6	4	36	17	8	4	59	18	1	1	26	11	10	1	50	12	2
M.	15	10 55	11	2	10	8	11	23	10	10	5	19	18	7	5	40	19	0	2	13	12	6	2	35	12	10
Tu.	16	11 48	11	44	11	1	—	—	—	—	6	0	19	4	6	21	19	9	2	56	13	1	3	16	13	5
W.	17	0 2 40	0	4	11	3	0	24	11	4	6	42	20	1	7	2	20	5	3	34	13	9	3	53	14	0
Th.	18	1 32	0	43	11	5	1	3	11	6	7	22	20	8	7	41	20	10	4	12	14	3	4	31	14	5
F.	19	2 23	1	22	11	7	1	42	11	7	8	1	21	0	8	20	21	2	4	50	14	6	5	10	14	7
S.	20	3 14	2	1	11	7	2	22	11	6	8	40	21	2	9	0	21	0	5	30	14	6	5	51	14	4
S.	21	4 5	2	43	11	5	3	3	11	4	9	21	20	9	9	42	20	6	6	12	14	2	6	34	13	11
M.	22	4 57	3	24	11	3	3	46	11	11	10	4	20	1	10	27	19	8	6	58	13	8	7	23	13	5
Tu.	23	5 50	4	8	10	11	4	32	10	9	10	52	19	3	11	22	18	9	7	49	13	1	8	16	12	9
W.	24	6 44	4	57	10	7	5	23	10	5	11	52	18	3	—	—	—	—	8	43	12	5	9	14	12	1
Th.	25	7 40	5	52	10	3	6	25	10	2	0	27	17	9	1	3	17	4	9	50	11	9	10	29	11	8
F.	26	8 37	7	6	10	1	7	49	10	2	1	39	17	2	2	16	17	2	11	8	11	7	11	46	11	9
S.	27	9 34	8	30	10	3	9	8	10	5	2	53	17	5	3	30	17	11	—	—	—	—	0	21	12	0
S.	28	10 30	9	44	10	7	10	19	10	10	4	6	18	5	4	39	18	11	0	56	12	4	1	29	12	9
M.	29	11 24	10	50	11	1	11	16	11	3	5	8	19	5	5	33	19	10	2	0	13	1	2	28	13	5
Tu.	30	morn.	11	40	11	5	—	—	—	—	5	56	20	2	6	19	20	6	2	52	13	8	3	15	13	11
W.	31	0 16	0	3	11	7	0	25	11	8	6	41	20	9	7	3	20	11	3	36	14	2	3	56	14	4
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.							
Phases of the Moon.											Moon's Declination at Noon.															
D. H. M.											M.D. ° ' "				M.D. ° ' "				M.D. ° ' "				M.D. ° ' "			
Full	-	-	1	6	48	Morning.					1	17	N.46	9	9	S. 7	17	14	S.25	25	16	N. 7				
Last Quarter	-	-	8	9	37	Afternoon.					2	15	49	10	12	15	18	11	14	26	17	54				
New	-	-	16	8	37	Afternoon.					3	13	1	11	14	53	19	7	25	27	18	36				
First Quarter	-	-	23	8	54	Afternoon.					4	9	38	12	16	55	20	3	9	28	18	9				
Full	-	-	30	8	29	Afternoon.					5	5	54	13	18	13	21	1	N.18	29	16	39				
											6	2	1	14	18	41	22	5	42	30	14	14				
In Apogee	-	-	9	11	0	Afternoon.					7	1	S.52	15	18	12	23	9	48	31	11	7				
In Perigee	-	-	23	10	0	Afternoon.					8	5	37	16	16	46	24	13	21							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
M.	1	3 0	13 1	3 23	13 4	1 57	16 3	2 21	16 6	8 9	13 5	8 31	13 7	○
Tu.	2	3 46	13 5	4 9	13 6	2 43	16 7	3 5	16 7	8 53	13 7	9 15	13 6	15.3
W.	3	4 32	13 5	4 54	13 3	3 27	16 6	3 48	16 4	9 37	13 4	9 59	13 2	16.3
T	4	5 15	13 1	5 37	12 10	4 10	16 2	4 32	15 11	10 21	12 11	10 42	12 7	17.3
F.	5	5 58	12 8	6 18	12 5	4 52	15 8	5 12	15 5	11 3	12 3	11 24	11 11	18.3
S.	6	6 38	12 2	6 58	11 10	5 32	15 1	5 53	14 9	11 46	11 7	—	—	19.3
S.	7	7 18	11 6	7 40	11 2	6 15	14 5	6 37	13 11	0 7	11 2	0 29	10 9	20.3
M.	8	8 4	10 9	8 28	10 4	6 59	13 7	7 22	13 2	0 51	10 5	1 14	10 1	○
Tu.	9	8 54	10 1	9 23	9 10	7 49	12 10	8 17	12 7	1 39	9 9	2 8	9 6	22.3
W.	10	9 56	9 8	10 29	9 8	8 49	12 4	9 23	12 3	2 41	9 3	3 16	9 2	23.3
Th.	11	11 3	9 8	11 37	9 9	9 57	12 3	10 31	12 3	3 55	9 1	4 31	9 1	24.3
F.	12	—	—	0 11	9 11	11 4	12 5	11 37	12 8	5 5	9 2	5 38	9 4	25.3
S.	13	0 44	10 2	1 12	10 4	—	—	0 7	12 11	6 8	9 8	6 33	10 0	26.3
S.	14	1 37	10 7	1 58	10 11	0 31	13 3	0 52	13 8	6 53	10 6	7 11	11 0	27.3
M.	15	2 19	11 3	2 39	11 8	1 13	14 2	1 34	14 7	7 29	11 5	7 46	11 11	28.3
Tu.	16	2 58	12 0	3 16	12 4	1 54	15 0	2 14	15 4	8 4	12 4	8 22	12 9	●
W.	17	3 35	12 8	3 54	12 11	2 34	15 9	2 53	16 0	8 40	13 0	8 59	13 2	0.6
Th.	18	4 13	13 1	4 32	13 3	3 11	16 2	3 29	16 3	9 18	13 3	9 37	13 4	1.6
F.	19	4 52	13 3	5 13	13 3	3 48	16 4	4 7	16 4	9 57	13 4	10 18	13 3	2.6
S.	20	5 34	13 2	5 55	13 1	4 28	16 3	4 49	16 2	10 40	13 2	11 1	12 11	3.6
S.	21	6 16	13 0	6 37	12 10	5 10	16 1	5 32	15 10	11 24	12 8	11 48	12 5	4.6
M.	22	7 0	12 7	7 24	12 4	5 56	15 7	6 21	15 3	—	—	0 13	12 1	5.6
Tu.	23	7 50	12 0	8 19	11 7	6 47	14 10	7 15	14 5	0 39	11 8	1 7	11 4	6.6
W.	24	8 49	11 2	9 23	10 10	7 44	14 1	8 17	13 8	1 36	11 0	2 8	10 8	7.6
Th.	25	10 2	10 8	10 41	10 7	8 54	13 5	9 35	13 3	2 46	10 4	3 29	10 2	8
F.	26	11 21	10 8	12 0	10 9	10 15	13 3	10 53	13 5	4 13	10 1	4 53	10 2	9.6
S.	27	—	—	0 35	11 0	11 29	13 7	—	—	5 30	10 3	6 4	10 7	10.6
S.	28	1 8	11 3	1 40	11 7	0 3	13 11	0 34	14 4	6 36	11 1	7 1	11 7	11.6
M.	29	2 7	11 11	2 32	12 3	1 1	14 9	1 27	15 3	7 24	12 1	7 43	12 6	12.6
Tu.	30	2 54	12 7	3 16	12 10	1 50	15 7	2 13	16 0	8 2	12 11	8 22	13 3	○
W.	31	3 37	13 1	3 56	13 3	2 35	16 3	2 54	16 5	8 42	13 5	9 0	13 5	14.6
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	3	52	Sub.	9	7	26	Sub.	17	10	25	Sub.	25	12	39	Sub.
2	4	20		10	7	50		18	10	44		26	12	52	
3	4	48		11	8	14		19	11	3		27	13	4	
4	5	15		12	8	37		20	11	21		28	13	16	
5	5	42		13	9	0		21	11	38		29	13	26	
6	6	9		14	9	22		22	11	54		30	13	36	
7	6	35		15	9	44		23	12	10		31	13	45	
8	7	1		16	10	5		24	12	25					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
M.	1	morn.	11	47	9	8	—	—	—	—	11	0	26	1	11	25	26	4	5	52	21	0	6	16	21	3
Tu.	2	0 43	0	12	9	9	0	37	9	10	11	49	26	5	—	—	—	6	40	21	5	7	3	21	5	
W.	3	1 37	1	1	9	10	1	23	9	10	0	12	26	5	0	33	26	4	7	23	21	3	7	44	21	0
Th.	4	2 27	1	44	9	9	2	5	9	9	0	54	26	1	1	14	25	9	8	5	20	9	8	25	20	5
F.	5	3 15	2	24	9	8	2	43	9	7	1	34	25	4	1	53	24	10	8	45	20	0	9	5	19	7
S.	6	4 1	3	3	9	5	3	21	9	3	2	13	24	3	2	32	23	8	9	23	19	1	9	41	18	6
☾	7	4 45	3	40	9	2	3	59	9	0	2	51	23	1	3	10	22	6	9	59	18	0	10	16	17	6
M.	8	5 28	4	18	8	10	4	38	8	9	3	29	21	10	3	49	21	3	10	34	16	11	10	54	16	3
Tu.	9	6 10	5	0	8	7	5	25	8	5	4	14	20	8	4	41	20	1	11	15	15	9	11	40	15	4
W.	10	6 54	5	54	8	3	6	24	8	1	5	13	19	9	5	47	19	6	—	—	—	0	7	15	1	
Th.	11	7 39	6	58	8	0	7	33	8	0	6	25	19	6	7	2	19	8	0	39	14	11	1	16	15	0
F.	12	8 25	8	9	8	1	8	45	8	3	7	38	19	11	8	13	20	5	1	57	15	2	2	36	15	6
S.	13	9 14	9	17	8	4	9	45	8	6	8	44	20	11	9	10	21	6	3	11	16	0	3	40	16	7
☾	14	10 4	10	9	8	8	10	32	8	10	9	32	22	1	9	53	22	9	4	7	17	2	4	32	17	10
M.	15	10 55	10	55	8	11	11	17	9	1	10	13	23	4	10	33	23	10	4	57	18	5	5	20	18	11
Tu.	16	11 48	11	39	9	2	12	0	9	4	10	53	24	4	11	13	24	10	5	43	19	5	6	5	19	11
W.	17	0 40	—	—	—	—	0	21	9	6	11	33	25	4	11	53	25	9	6	25	20	4	6	44	20	9
Th.	18	1 32	0	42	9	8	1	2	9	9	—	—	—	—	0	13	26	0	7	4	21	0	7	23	21	3
F.	19	2 23	1	22	9	10	1	42	9	10	0	32	26	3	0	53	26	4	7	42	21	3	8	2	21	3
S.	20	3 14	2	2	9	11	2	22	9	11	1	13	26	4	1	32	26	2	8	23	21	2	8	43	21	0
☾	21	4 5	2	42	9	10	3	2	9	9	1	51	25	11	2	12	25	6	9	4	20	8	9	26	20	4
M.	22	4 57	3	23	9	8	3	45	9	7	2	34	25	1	2	56	24	7	9	47	19	10	10	9	19	4
Tu.	23	5 50	4	9	9	5	4	34	9	3	3	20	24	0	3	45	23	4	10	32	18	9	10	55	18	2
W.	24	6 44	5	0	9	1	5	27	8	11	4	11	22	8	4	42	21	11	11	18	17	5	11	46	16	10
Th.	25	7 40	5	59	8	9	6	36	8	7	5	18	21	5	5	59	21	3	—	—	—	0	19	16	7	
F.	26	8 37	7	15	8	6	7	56	8	7	6	44	21	3	7	26	21	6	0	56	16	5	1	42	16	7
S.	27	9 34	8	36	8	8	9	13	8	9	8	4	21	11	8	40	22	5	2	26	16	11	3	7	17	5
☾	28	10 30	9	49	8	11	10	20	9	1	9	13	23	2	9	41	23	10	3	45	18	1	4	18	18	9
M.	29	11 24	10	47	9	3	11	12	9	4	10	7	24	5	10	29	24	11	4	49	19	4	5	15	19	10
Tu.	30	morn.	11	37	9	6	—	—	—	—	10	51	25	4	11	13	25	8	5	41	20	4	6	6	20	8
W.	31	0 16	0	1	9	7	0	23	9	8	11	35	26	0	11	55	26	2	6	27	21	0	6	46	21	2
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.								10ft. 6in.											
Phases of the Moon.												Moon's Declination at Noon.														
			D.	H.	M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'			
Full - - - - -			1	6	48	Morning.						1	17	N.46	9	9	S. 7	17	14	S. 25	25	16	N. 7			
Last Quarter - -			8	9	37	Afternoon.						2	15	49	10	12	15	18	11	14	26	17	54			
New - - - - -			16	8	37	Afternoon.						3	13	1	11	14	53	19	7	25	27	18	36			
First Quarter -			23	8	54	Afternoon.						4	9	38	12	16	55	20	3	9	28	18	9			
Full - - - - -			30	8	29	Afternoon.						5	5	54	13	18	13	21	1	N.18	29	16	39			
									6	2	1	14	18	41	22	5	42	30	14	14						
In Apogee - -			9	11	0	Afternoon.						7	1	S. 52	15	18	12	23	9	48	31	11	7			
In Perigee - -			23	10	0	Afternoon.						8	5	37	16	16	46	24	13	21						

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. 1 LIVERPOOL add 12 m. 1 PEMBROKE add 20 m.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	D.
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	
M.	1	6 33 37 2	6 58 37 7	9 53 16 1	10 16 16 3	10 51 11 0	11 13 11 1	⊙						
Tu.	2	7 24 37 10	7 47 37 11	10 38 16 3	10 59 16 3	11 36 11 2	11 59 11 1	15.3						
W.	3	8 7 37 9	8 27 37 6	11 18 16 2	11 40 16 0	—	0 21 11 0	16.3						
Th.	4	8 47 37 2	9 5 36 8	—	0 2 15 9	0 43 10 11	1 5 10 9	17.3						
F.	5	9 23 36 1	9 41 35 4	0 23 15 6	0 45 15 3	1 26 10 7	1 47 10 5	18.3						
S.	6	9 58 34 7	10 13 33 8	1 6 14 11	1 28 14 7	2 7 10 2	2 28 10 0	19.3						
S.	7	10 29 32 9	10 45 31 9	1 48 14 3	2 10 13 10	2 48 9 10	3 9 9 7	20.3						
M.	8	11 13 30 10	11 21 29 10	2 32 13 6	2 55 13 2	3 31 9 5	3 53 9 3	⊙						
Tu.	9	11 45 29 1	—	3 20 12 10	3 49 12 7	4 19 9 0	4 47 8 10	22.3						
W.	10	0 14 28 5	0 44 27 11	4 22 12 4	4 56 12 3	5 17 8 9	5 48 8 8	23.3						
Th.	11	1 17 27 9	1 53 27 10	5 31 12 3	6 5 12 4	6 20 8 8	6 52 8 9	24.3						
F.	12	1 31 28 1	3 8 28 7	6 38 12 6	7 11 12 9	7 25 8 10	7 58 9 0	25.3						
S.	13	3 45 29 3	4 17 30 0	7 40 13 0	8 6 13 4	8 30 9 2	8 57 9 4	26.3						
S.	14	4 45 30 11	5 12 32 0	8 28 13 8	8 49 14 1	9 22 9 7	9 46 9 9	27.3						
M.	15	5 38 33 0	6 13 33 10	9 8 14 5	9 27 14 9	10 8 10 0	10 27 10 2	28.3						
Tu.	16	6 24 34 8	6 47 35 5	9 47 15 1	10 6 15 4	10 45 10 5	11 3 10 7	●						
W.	17	7 8 36 1	7 28 36 10	10 25 15 7	10 44 15 10	11 22 10 9	11 41 10 11	0.6						
Th.	18	7 47 37 4	8 6 37 7	11 0 16 0	11 18 16 1	12 0 10 11	—	1.6						
F.	19	8 26 37 10	8 45 37 11	11 37 16 2	11 59 16 2	0 20 11 0	0 41 11 0	2.6						
S.	20	9 4 37 10	9 22 37 7	—	0 21 16 1	1 2 10 11	1 24 10 10	3.6						
S.	21	9 42 37 2	10 13 36 7	0 43 15 11	1 5 15 8	1 45 10 9	2 7 10 7	4.6						
M.	22	10 20 35 9	10 39 34 11	1 29 15 5	1 54 15 1	2 30 10 5	2 54 10 3	5.6						
Tu.	23	11 0 33 11	11 22 32 10	2 20 14 9	2 48 14 5	3 19 10 1	3 46 9 11	⊙						
W.	24	11 47 31 9	—	3 16 14 0	3 49 13 8	4 14 9 9	4 47 9 6	7.6						
Th.	25	0 19 30 10	0 55 30 4	4 27 13 5	5 8 13 4	5 23 9 3	5 59 9 1	8.6						
F.	26	1 35 30 2	2 16 30 4	5 48 13 4	6 27 13 6	6 36 9 3	7 14 9 5	9.6						
S.	27	2 58 30 9	3 41 31 6	7 2 13 8	7 36 13 11	7 50 9 7	8 26 9 9	10.6						
S.	28	4 22 32 5	4 58 33 7	8 9 14 4	8 37 14 9	9 1 9 11	9 33 10 2	11.6						
M.	29	5 30 34 6	5 56 35 4	9 2 15 1	9 24 15 4	10 1 10 4	10 23 10 6	12.6						
Tu.	30	6 22 36 1	6 47 36 8	9 46 15 8	10 8 15 10	10 44 10 9	11 5 10 11	⊙						
W.	31	7 9 37 1	7 30 37 5	10 27 16 0	10 45 16 2	11 24 11 0	11 43 11 1	14.6						
Half Mean Spring } Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	52	Sub.	9	7	26	Sub.	17	10	25	Sub.	25	12	39	Sub.
2	4	20		10	7	50		18	10	44		26	12	52	
3	4	48		11	8	14		19	11	3		27	13	4	
4	5	15		12	8	37		20	11	21		28	13	16	
5	5	42		13	9	0		21	11	38		29	13	26	
6	6	9		14	9	22		22	11	54		30	13	36	
7	6	35		15	9	44		23	12	10		31	13	45	
8	7	1		16	10	5		24	12	25					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
M.	1	morn.	10	30	9	7	10	53	9	7	7	43	7	9	8	6	7	10	4	57	11	3	5	21	11	5
Tu.	2	0 43	11	15	9	7	11	37	9	6	8	28	7	11	8	49	7	10	5	45	11	6	6	7	11	5
W.	3	1 37	11	57	9	6	—	—	—	—	9	8	7	9	9	28	7	7	6	27	11	3	6	49	11	1
Th.	4	2 27	0	19	9	5	0	41	9	4	9	47	7	5	10	6	7	3	7	11	10	11	7	31	10	7
F.	5	3 15	1	2	9	3	1	23	9	2	10	26	7	1	10	46	6	11	7	50	10	4	8	9	10	0
S.	6	4 1	1	45	9	1	2	8	9	0	11	6	6	8	11	29	6	5	8	29	9	9	8	49	9	5
S.	7	4 45	2	30	8	10	2	52	8	8	11	56	6	2	—	—	—	—	9	11	9	2	9	36	8	11
M.	8	5 28	3	14	8	6	3	36	8	4	0	24	5	11	0	52	5	9	10	1	8	8	10	29	8	5
Tu.	9	6 10	4	1	8	3	4	28	8	2	1	24	5	7	1	59	5	6	10	58	8	3	11	30	8	2
W.	10	6 54	4	58	8	0	5	29	7	11	2	34	5	5	3	7	5	6	—	—	—	—	0	2	8	1
Th.	11	7 39	6	1	7	11	6	35	7	11	3	39	5	8	4	9	5	9	0	35	8	1	1	9	8	2
F.	12	8 25	7	10	7	11	7	45	8	0	4	39	5	11	5	7	6	1	1	43	8	3	2	17	8	5
S.	13	9 14	8	15	8	1	8	40	8	3	5	31	6	2	5	52	6	4	2	47	8	8	3	11	8	11
S.	14	10 4	9	2	8	6	9	23	8	8	6	12	6	6	6	33	6	8	3	32	9	3	3	51	9	6
M.	15	10 55	9	43	8	10	10	3	9	0	6	54	6	10	7	15	7	0	4	10	9	10	4	29	10	2
Tu.	16	11 48	10	23	9	2	10	42	9	3	7	36	7	2	7	56	7	4	4	49	10	6	5	10	10	9
W.	17	0 40	11	1	9	4	11	20	9	5	8	15	7	6	8	33	7	8	5	30	11	0	5	50	11	2
Th.	18	1 32	11	38	9	5	11	56	9	5	8	50	7	9	9	8	7	9	6	8	11	3	6	26	11	3
F.	19	2 23	—	—	—	—	0	16	9	6	9	27	7	9	9	46	7	8	6	46	11	3	7	7	11	2
S.	20	3 14	0	38	9	6	1	0	9	6	10	5	7	7	10	24	7	5	7	28	11	0	7	48	10	10
S.	21	4 5	1	22	9	5	1	44	9	4	10	45	7	4	11	8	7	2	8	9	10	7	8	31	10	4
M.	22	4 57	2	9	9	3	2	35	9	2	11	35	6	11	—	—	—	—	8	55	10	1	9	21	9	10
Tu.	23	5 50	3	2	9	0	3	30	8	10	0	6	6	8	0	41	6	5	9	52	9	6	10	23	9	4
W.	24	6 44	3	59	8	8	4	29	8	6	1	16	6	3	1	56	6	1	10	58	9	1	11	36	8	11
Th.	25	7 40	5	4	8	5	5	41	8	4	2	39	6	0	3	18	6	1	—	—	—	—	0	14	8	10
F.	26	8 37	6	18	8	3	6	58	8	3	3	55	6	3	4	30	6	5	0	52	8	10	1	32	8	11
S.	27	9 34	7	36	8	4	8	11	8	5	4	59	6	7	5	27	6	9	2	8	9	1	2	43	9	4
S.	28	10 30	8	43	8	8	9	11	8	11	5	55	6	11	6	21	7	1	3	14	9	8	3	40	10	0
M.	29	11 24	9	37	9	1	10	0	9	3	6	47	7	3	7	11	7	4	4	4	10	4	4	26	10	8
Tu.	30	morn.	10	22	9	4	10	43	9	5	7	35	7	6	7	58	7	8	4	48	10	11	5	11	11	1
W.	31	0 16	11	3	9	6	11	22	9	6	8	18	7	9	8	35	7	10	5	32	11	3	5	52	11	4

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - -	1	6	48	Morning.
Last Quarter -	8	9	37	Afternoon.
New- - - - -	16	8	37	Afternoon.
First Quarter	23	8	54	Afternoon.
Full - - - - -	30	8	29	Afternoon.
In Apogee - -	9	11	0	Afternoon.
In Perigee- -	23	10	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	N.46	9	9	8. 7	17	14	S. 25	25	16	N. 7
2	15	49	10	12	15	18	11	14	26	17	54
3	13	1	11	14	53	19	7	25	27	18	36
4	9	38	12	16	55	20	3	9	28	18	9
5	5	54	13	18	13	21	1	N.18	29	16	39
6	2	1	14	18	41	22	5	42	30	14	14
7	1	S. 52	15	18	12	23	9	48	31	11	7
8	5	37	16	16	46	24	13	21			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 0 m.

JANUARY, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	D.									
M.	1	4	17	14	9	4	40	15	0	4	40	11	9	5	5	11	11	5	3	12	5	5	27	12	6	0	
Tu.	2	5	3	15	1	5	26	15	1	5	30	12	0	5	54	12	0	5	50	12	7	6	14	12	8	15.3	
W.	3	5	48	15	0	6	10	14	10	6	15	11	11	6	36	11	10	6	36	12	7	6	57	12	6	16.3	
Th.	4	6	31	14	7	6	51	14	4	6	56	11	8	7	16	11	6	7	18	12	5	7	37	12	4	17.3	
F.	5	7	12	14	0	7	32	13	8	7	36	11	3	7	56	11	0	7	56	12	2	8	15	11	11	18.3	
S.	6	7	53	13	4	8	13	12	11	8	14	10	9	8	31	10	6	8	32	11	9	8	49	11	6	19.3	
S.	7	8	34	12	5	8	56	11	11	8	49	10	3	9	7	9	11	9	6	11	3	9	23	10	11	20.3	
M.	8	9	17	11	6	9	40	11	1	9	26	9	8	9	46	9	5	9	40	10	8	10	3	10	5	21.3	
Tu.	9	10	7	10	9	10	39	10	7	10	9	9	2	10	38	9	0	10	30	10	1	10	59	9	10	22.3	
W.	10	11	12	10	6	11	46	10	6	11	9	8	10	11	43	8	10	11	29	9	8	—	—	—	—	23.3	
Th.	11	—	—	—	—	0	21	10	6	—	—	—	—	0	19	8	10	0	1	9	6	0	33	9	7	24.3	
F.	12	0	55	10	8	1	29	11	0	0	55	8	11	1	32	9	1	1	6	9	8	1	41	9	10	25.3	
S.	13	1	58	11	4	2	23	11	8	2	7	9	4	2	36	9	7	2	16	10	1	2	47	10	4	26.3	
S.	14	2	46	12	0	3	8	12	5	3	1	9	10	3	26	10	1	3	15	10	7	3	41	10	11	27.3	
M.	15	3	29	12	10	3	49	13	2	3	49	10	5	4	11	10	8	4	7	11	2	4	31	11	5	28.3	
Tu.	16	4	9	13	7	4	30	14	0	4	32	11	0	4	53	11	3	4	54	11	8	5	16	11	11	29.3	
W.	17	4	49	14	4	5	8	14	8	5	13	11	5	5	34	11	8	5	36	12	1	5	55	12	3	0.6	
Th.	18	5	27	14	10	5	47	15	0	5	54	11	9	6	14	11	10	6	14	12	5	6	34	12	6	1.6	
F.	19	6	7	15	0	6	28	15	0	6	34	11	11	6	54	11	11	6	55	12	7	7	16	12	8	2.6	
S.	20	6	49	14	11	7	10	14	9	7	14	11	10	7	34	11	9	7	36	12	8	7	55	12	7	3.6	
S.	21	7	32	14	6	7	55	14	3	7	55	11	7	8	16	11	4	8	15	12	6	8	35	12	4	4.6	
M.	22	8	19	13	10	8	44	13	5	8	38	11	2	9	0	10	11	8	56	12	2	9	16	11	11	5.6	
Tu.	23	9	11	12	11	9	37	12	5	9	24	10	7	9	47	10	4	9	38	11	7	10	2	11	4	6.6	
W.	24	10	8	12	0	10	44	11	9	10	12	10	0	10	43	9	9	10	31	11	0	11	5	10	7	7.6	
Th.	25	11	23	11	7	—	—	—	—	11	21	9	8	—	—	—	—	11	41	10	5	—	—	—	—	—	8.6
F.	26	0	4	11	7	0	44	11	9	0	1	9	7	0	41	9	8	0	18	10	3	0	55	10	5	9.6	
S.	27	1	20	12	0	1	54	12	4	1	22	9	10	2	3	10	0	1	33	10	7	2	12	10	9	10.6	
S.	28	2	26	12	9	2	55	13	2	2	41	10	3	3	12	10	7	2	52	11	1	3	27	11	5	11.6	
M.	29	3	22	13	6	3	45	13	11	3	41	10	11	4	6	11	2	3	59	11	8	4	26	11	11	12.6	
Tu.	30	4	8	14	3	4	31	14	6	4	30	11	5	4	53	11	7	4	52	12	1	5	17	12	3	13.6	
W.	31	4	50	14	9	5	10	14	11	5	15	11	9	5	36	11	10	5	38	12	4	5	57	12	6	14.6	
Half Mean Spring Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.									

Equation of Time at Noon.

M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	3	52	Sub.	9	7	26	Sub.	17	10	25	Sub.	25	12	39	Sub.
2	4	20		10	7	50		18	10	44		26	12	52	
3	4	48		11	8	14		19	11	3		27	13	4	
4	5	15		12	8	37		20	11	21		28	13	16	
5	5	42		13	9	0		21	11	38		29	13	26	
6	6	9		14	9	22		22	11	54		30	13	36	
7	6	35		15	9	44		23	12	10		31	13	45	
8	7	1		16	10	5		24	12	25					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.	
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Th.	1	1m 6	4	40	19	4	4	58	19	4	6	36	15	11	6	55	15	3	0	16	12	9	0	37	12	9
F.	2	1 53	5	16	19	2	5	33	18	11	7	13	15	9	7	29	15	1	0	57	12	9	1	16	12	8
S.	3	2 38	5	49	18	8	6	7	18	4	7	45	15	4	8	0	14	7	1	34	12	6	1	51	12	5
Th.	4	3 22	6	23	17	11	6	41	17	5	8	18	14	9	8	35	14	1	2	8	12	3	2	25	12	1
M.	5	4 5	6	58	16	11	7	16	16	4	8	48	14	0	9	2	13	5	2	43	11	10	3	0	11	8
Tu.	6	4 48	7	34	15	8	7	53	15	0	9	17	13	3	9	34	12	10	3	17	11	5	3	34	11	2
W.	7	5 32	8	13	14	5	8	36	13	9	9	52	12	5	10	11	12	2	3	52	10	10	4	11	10	7
Th.	8	6 18	9	3	13	4	9	35	13	0	10	36	11	10	11	3	11	8	4	33	10	3	4	59	9	11
F.	9	7 5	10	12	12	10	10	54	12	10	11	35	11	6	—	—	—	—	5	29	9	9	6	5	9	7
S.	10	7 54	11	36	13	0	—	—	—	—	0	12	11	8	0	50	11	6	6	43	9	6	7	24	9	7
Th.	11	8 44	0	15	13	4	0	53	13	10	1	31	12	0	2	9	12	0	8	3	9	10	8	42	10	2
M.	12	9 36	1	25	14	5	1	52	15	3	2	47	12	10	3	20	12	10	9	16	10	7	9	44	10	11
Tu.	13	10 28	2	15	16	1	2	38	16	11	3	52	13	10	4	18	13	9	10	9	11	4	10	33	11	8
W.	14	11 21	2	58	17	9	3	17	18	6	4	43	14	9	5	7	14	6	10	53	12	1	11	13	12	5
Th.	15	0a 13	3	37	19	2	3	56	19	7	5	30	15	5	5	52	15	2	11	33	12	8	11	52	12	11
F.	16	1 6	4	16	20	0	4	36	20	3	6	14	16	0	6	34	15	8	—	—	—	—	0	12	13	1
S.	17	1 59	4	57	20	6	5	17	20	6	6	55	16	4	7	15	15	10	0	33	13	3	0	55	13	4
Th.	18	2 52	5	38	20	5	5	58	20	2	7	35	16	3	7	56	15	9	1	17	13	4	1	38	13	3
M.	19	3 46	6	19	19	10	6	40	19	5	8	17	15	11	8	38	15	5	2	0	13	2	2	20	13	1
Tu.	20	4 40	7	3	18	9	7	26	17	11	9	0	15	4	9	20	14	10	2	41	12	10	3	6	12	7
W.	21	5 36	7	50	17	2	8	15	16	3	9	41	14	6	10	5	14	1	3	27	12	3	3	49	11	11
Th.	22	6 32	8	44	15	5	9	16	14	10	10	30	13	8	10	59	13	4	4	13	11	6	4	41	11	1
F.	23	7 28	9	54	14	4	10	38	14	2	11	30	12	10	—	—	—	—	5	11	10	8	5	47	10	4
S.	24	8 24	11	26	14	2	—	—	—	—	0	7	12	10	0	48	12	6	6	29	10	2	7	15	10	2
Th.	25	9 18	0	11	14	5	0	51	14	10	1	31	13	0	2	13	12	9	7	58	10	5	8	40	10	8
M.	26	10 9	1	26	15	5	1	56	16	2	2	52	13	7	3	28	13	5	9	17	11	1	9	48	11	5
Tu.	27	10 59	2	21	16	10	2	43	17	6	3	58	14	4	4	26	14	11	10	15	11	9	10	38	12	0
W.	28	11 46	3	3	18	1	3	23	18	6	4	51	15	0	5	13	14	8	10	59	12	3	11	19	12	4
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in							

Phases of the Moon.				Moon's Declination at Noon.											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	7	7	39	1	7	N.31	9	17	S.37	17	0	S.11	25	17	N. 2
New - - - -	15	10	13	2	4	0	10	18	25	18	4	N.21	26	14	57
First Quarter-	22	4	48	3	0	S.15	11	18	21	19	8	38	27	12	7
				4	4	5	12	17	20	20	12	23	28	8	44
In Perigee - -	6	8	0	5	7	42	13	15	22	21	15	22			
In Apogee - -	18	4	0	6	10	58	14	12	31	22	17	23			
				7	13	47	15	8	53	23	18	21			
				8	16	3	16	4	42	24	18	12			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	
Th.	1	—	—	0 10	18 11	1 32	16 3	1 52	16 3	3 2	19 1	3 22	19 3	15.6
F.	2	0 31	18 11	0 51	18 9	2 11	16 3	2 29	16 2	3 41	19 4	3 59	19 4	16.6
S.	3	1 10	18 7	1 28	18 5	2 46	16 1	3 3	16 0	4 16	19 3	4 32	19 2	17.6
S.	4	1 47	18 2	2 4	17 11	3 19	15 10	3 36	15 7	4 51	19 0	5 8	18 9	18.6
M.	5	2 22	17 7	2 40	17 3	3 53	15 4	4 11	15 0	5 25	18 6	5 43	18 2	19.6
Tu.	6	2 59	16 9	3 16	16 4	4 28	14 9	4 46	14 5	5 59	17 11	6 17	17 7	20.6
W.	7	3 33	15 10	3 52	15 4	5 4	14 1	5 23	13 9	6 35	17 2	6 56	16 10	21.6
Th.	8	4 13	14 10	4 37	14 4	5 46	13 5	6 11	13 1	7 16	16 5	7 39	16 1	22.6
F.	9	5 5	13 11	5 37	13 8	6 40	12 9	7 15	12 7	8 8	15 9	8 42	15 6	23.6
S.	10	6 13	13 7	6 50	13 9	7 54	12 6	8 35	12 7	9 20	15 4	10 0	15 3	24.6
S.	11	7 28	14 2	8 8	14 8	9 15	12 10	9 53	13 1	10 39	15 4	11 19	15 6	25.6
M.	12	8 41	15 2	9 7	15 9	10 30	13 5	11 0	13 10	11 57	15 10	—	—	26.6
Tu.	13	9 32	16 4	9 56	17 0	11 26	14 3	11 49	14 8	0 29	16 3	0 54	16 8	27.6
W.	14	10 19	17 7	10 41	18 2	—	—	0 11	15 1	1 16	17 2	1 38	17 8	28.6
Th.	15	11 2	18 8	11 23	19 0	0 31	15 6	0 50	15 10	1 59	18 2	2 20	18 7	29.6
F.	16	11 45	19 4	—	—	1 10	16 2	1 29	16 6	2 40	19 0	3 0	19 5	30.6
S.	17	0 7	19 8	0 29	19 10	1 48	16 8	2 8	16 9	3 19	19 8	3 40	19 11	31.6
S.	18	0 52	19 11	1 14	19 10	2 28	16 10	2 48	16 10	3 58	20 1	4 18	20 2	32.6
M.	19	1 37	19 9	1 59	19 6	3 8	16 10	3 28	16 8	4 39	20 1	4 59	19 11	33.6
Tu.	20	2 22	19 2	2 46	18 9	3 48	16 5	4 10	16 2	5 19	19 9	5 41	19 5	34.6
W.	21	3 9	18 1	3 31	17 6	4 33	15 9	4 57	15 4	6 4	19 1	6 28	18 7	35.6
Th.	22	3 54	16 10	4 21	16 2	5 21	14 10	5 47	14 5	6 51	18 1	7 17	17 7	36.6
F.	23	4 49	15 6	5 22	15 0	6 19	13 10	6 54	13 7	7 47	17 1	8 22	16 8	37.6
S.	24	5 59	14 9	6 41	14 9	7 34	13 4	8 20	13 4	9 3	16 4	9 46	16 1	38.6
S.	25	7 24	15 0	8 6	15 5	9 6	13 5	9 49	13 8	10 30	16 1	11 13	16 3	39.6
M.	26	8 42	16 0	9 11	16 6	10 28	14 0	11 1	14 5	11 53	16 6	—	—	40.6
Tu.	27	9 38	17 0	10 2	17 5	11 30	14 9	11 54	15 1	0 27	16 10	0 57	17 3	41.6
W.	28	10 25	17 10	10 47	18 2	—	—	0 17	15 5	1 22	17 8	1 46	18 0	42.6
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	13 53	Sub.	9	14 29	Sub.	17	14 17	Sub.	25	13 19	Sub.
2	14 0		10	14 30		18	14 12		26	13 8	
3	14 7		11	14 31		19	14 6		27	12 58	
4	14 13		12	14 30		20	14 0		28	12 46	
5	14 18		13	14 29		21	13 53				
6	14 22		14	14 27		22	13 45				
7	14 25		15	14 24		23	13 37				
8	14 28		16	14 21		24	13 28				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.					
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
Th.	1	1 m6	0	45	11	8	1	5	11	8	7	24	21	0	7	44	21	1	4	15	14	6	4	34	14	7				
F.	2	1 53	1	25	11	8	1	44	11	7	8	3	21	1	8	20	20	11	4	52	14	7	5	10	14	5				
S.	3	2 38	2	2	11	6	2	19	11	6	8	37	20	9	8	54	20	6	5	27	14	2	5	45	13	11				
♄.	4	3 22	2	36	11	3	2	54	11	1	9	12	20	1	9	29	19	9	6	4	13	8	6	21	13	5				
M.	5	4 5	3	12	10	11	3	30	10	9	9	47	19	3	10	4	18	10	6	39	13	1	6	58	12	9				
Tu.	6	4 48	3	45	10	7	4	3	10	5	10	22	18	4	10	40	17	10	7	17	12	5	7	36	12	1				
W.	7	5 32	4	20	10	2	4	38	10	0	11	0	17	4	11	26	16	10	7	55	11	9	8	18	11	4				
Th.	8	6 18	4	59	9	10	5	22	9	8	11	53	16	4	—	—	—	—	8	43	11	0	9	11	10	9				
F.	9	7 5	5	49	9	6	6	21	9	5	0	25	15	11	0	59	15	8	9	46	10	6	10	24	10	5				
S.	10	7 54	7	1	9	4	7	43	9	5	1	34	15	6	2	10	15	6	11	2	10	5	11	40	10	7				
♄.	11	8 44	8	23	9	6	9	0	9	8	2	47	15	9	3	23	16	3	—	—	—	—	0	15	10	10				
M.	12	9 36	9	36	9	11	10	8	10	2	3	58	16	10	4	29	17	5	0	49	11	3	1	19	11	8				
Tu.	13	10 28	10	35	10	5	11	0	10	9	4	55	18	1	5	18	18	9	1	45	12	1	2	10	12	7				
W.	14	11 21	11	22	11	0	11	43	11	4	5	39	19	4	5	58	19	11	2	34	13	0	2	55	13	6				
Th.	15	0 a13	—	—	—	—	0	3	11	6	6	19	20	5	6	40	20	11	3	15	13	11	3	34	14	3				
F.	16	1 6	0	23	11	8	0	42	11	10	7	0	21	3	7	20	21	8	3	52	14	8	4	11	14	11				
S.	17	1 59	1	1	11	11	1	21	12	0	7	40	21	11	8	1	22	1	4	31	15	2	4	51	15	4				
♄.	18	2 52	1	42	12	0	2	3	12	0	8	21	22	2	8	41	22	1	5	11	15	3	5	31	15	2				
M.	19	3 46	2	23	11	11	2	44	11	10	9	4	21	10	9	24	21	6	5	53	14	11	6	15	14	8				
Tu.	20	4 40	3	6	11	8	3	28	11	6	9	46	21	0	10	9	20	5	6	38	14	3	7	3	13	11				
W.	21	5 36	3	51	11	3	4	13	11	0	10	32	19	9	10	56	19	2	7	28	13	6	7	52	13	0				
Th.	22	6 32	4	35	10	9	5	1	10	6	11	26	18	6	—	—	—	—	8	20	12	6	8	51	12	1				
F.	23	7 28	5	30	10	3	6	2	10	0	0	2	17	10	0	39	17	3	9	25	11	8	10	5	11	4				
S.	24	8 24	6	40	9	11	7	28	9	10	1	17	16	10	1	56	16	8	10	48	11	3	11	31	11	3				
♄.	25	9 18	8	14	9	11	8	56	10	1	2	38	16	9	3	18	17	2	—	—	—	—	0	10	11	6				
M.	26	10 10	9	35	10	3	10	9	10	6	3	56	17	9	4	30	18	4	0	47	11	10	1	20	12	3				
Tu.	27	10 59	10	40	10	9	11	5	11	0	4	59	18	11	5	22	19	4	1	49	12	8	2	16	13	1				
W.	28	11 46	11	27	11	3	11	48	11	5	5	44	19	10	6	4	20	2	2	39	13	5	3	1	13	8				
Half Mean Spring Range			5 ft. 9 in.								10 ft. 5 in.								7 ft. 2 in.											

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
Last Quarter -	7	7	39	Afternoon.	1	7	N. 31	9	17	8. 37	17	0	8. 11	25	17	N. 2
New - - - -	15	10	13	Morning.	2	4	0	10	18	25	18	4	N. 21	26	14	57
First Quarter	22	4	48	Morning.	3	0	8. 15	11	18	21	19	8	38	27	12	7
					4	4	5	12	17	20	20	12	23	28	8	44
In Apogee - -	6	8	0	Afternoon.	5	7	42	13	15	22	21	15	22			
In Perigee - -	18	4	0	Afternoon.	6	10	58	14	12	31	22	17	23			
					7	13	47	15	8	53	23	18	21			
					8	16	3	16	4	42	24	18	12			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH *subtra* 5 m. | HULL *add* 1 m. | SUNDERLAND *add* 5 m.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's Age at Noon.		
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.										
Th.	1	4	15	13	4	4	35	13	5	3	12	16	6	3	30	16	6	9	19	13	5	9	39	13	4	15.6		
F.	2	4	54	13	4	5	13	13	2	3	49	16	4	4	8	16	2	9	58	13	2	10	15	13	0	16.6		
S.	3	5	31	12	11	5	49	12	9	4	26	16	0	4	43	15	9	10	33	12	9	10	52	12	5	17.6		
S.	4	6	8	12	6	6	25	12	3	5	1	15	6	5	18	15	3	11	9	12	1	11	28	11	9	18.6		
M.	5	6	43	12	0	7	1	11	9	5	37	14	11	5	56	14	7	11	48	11	5	—	—	—	—	19.6		
Tu.	6	7	19	11	5	7	38	11	0	6	16	14	3	6	35	13	9	0	7	11	0	0	26	10	7	20.6		
W.	7	7	59	10	7	8	24	10	2	6	55	13	4	7	18	13	0	0	46	10	3	1	10	9	10	21.6		
Th.	8	8	50	9	10	9	21	9	7	7	45	12	7	8	15	12	3	1	35	9	6	2	6	9	3	22.6		
F.	9	9	58	9	5	10	36	9	4	8	51	12	0	9	29	11	11	2	43	9	0	3	23	8	10	23.6		
S.	10	11	14	9	5	11	53	9	7	10	9	12	0	10	46	12	1	4	7	8	10	4	46	8	11	24.6		
S.	11	—	—	—	—	0	29	9	10	11	21	12	4	11	55	12	8	5	23	9	0	5	58	9	4	25.6		
M.	12	1	3	10	2	1	31	10	6	—	—	—	—	0	25	13	1	6	27	9	10	6	50	10	5	26.6		
Tu.	13	1	55	10	11	2	17	11	4	0	49	13	7	1	11	14	3	7	11	11	0	7	30	11	8	27.6		
W.	14	2	38	11	10	2	57	12	5	1	33	14	10	1	53	15	5	7	46	12	4	8	3	12	11	28.6		
Th.	15	3	16	12	10	3	35	13	3	2	13	15	11	2	32	16	4	8	21	13	4	8	39	13	8	29.6		
F.	16	3	53	13	7	4	12	13	10	2	51	16	8	3	9	17	0	8	57	13	11	9	16	14	1	30.6		
S.	17	4	32	14	0	4	53	14	1	3	28	17	2	3	48	17	2	9	37	14	2	9	58	14	2	31.6		
S.	18	5	14	14	0	5	35	13	10	4	9	17	2	4	30	17	0	10	19	14	0	10	42	13	9	32.6		
M.	19	5	57	13	8	6	19	13	6	4	52	16	10	5	13	16	7	11	4	13	6	11	26	13	1	33.6		
Tu.	20	6	41	13	3	7	5	12	10	5	36	16	3	6	2	15	10	11	54	12	8	—	—	—	—	34.6		
W.	21	7	29	12	5	7	55	11	11	6	27	15	4	6	52	14	9	0	19	12	2	0	43	11	7	35.6		
Th.	22	8	24	11	4	8	58	10	10	7	19	14	3	7	53	13	9	1	11	11	1	1	43	10	8	36.6		
F.	23	9	35	10	6	10	17	10	3	8	29	13	3	9	10	12	11	2	20	10	2	3	2	9	11	8	37.6	
S.	24	11	0	10	2	11	44	10	4	9	55	12	10	10	37	12	11	3	51	9	9	4	37	9	8	38.6		
S.	25	—	—	—	—	0	24	10	6	11	17	13	1	11	54	13	5	5	19	9	9	5	56	10	0	9	39.6	
M.	26	1	0	10	9	1	32	11	1	—	—	—	—	0	26	13	10	6	28	10	6	6	53	11	1	10	40.6	
Tu.	27	1	58	11	6	2	22	11	10	0	52	14	3	1	16	14	9	7	14	11	7	7	33	12	1	11	41.6	
W.	28	2	43	12	3	3	2	12	7	1	38	15	3	1	59	15	7	7	50	12	6	8	8	12	11	1	12	42.6
Half Mean Spring } Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.										
Equation of Time at Noon.																												
M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.					
1	13	53		9	14	29		17	14	17		25	13	19														
2	14	0		10	14	30		18	14	12		26	13	8		26	13	8										
3	14	7		11	14	31		19	14	6		27	12	58		27	12	58										
4	14	13		12	14	30		20	14	0		28	12	46		28	12	46										
5	14	18		13	14	29		21	13	53																		
6	14	22		14	14	27		22	13	45																		
7	14	25		15	14	24		23	13	37																		
8	14	28		16	14	21		24	13	28																		

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required — for
NORTH SHIELDS add 8 m. | LEITH add 13 m. | THURSO add 14 m.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.							
Th.	1	1 m 6	0 43	9 9	1 4	9 10	—	—	0 15	26 3	7 6	21 3	7 25	21 3												
F.	2	1 53	1 24	9 10	1 42	9 9	0 34	26 3	0 53	26 1	7 43	21 1	7 59	20 10												
S.	3	2 38	1 59	9 9	2 16	9 8	1 10	25 10	1 27	25 6	8 16	20 6	8 34	20 2												
Th.	4	3 22	2 34	9 7	2 51	9 6	1 44	25 0	2 0	24 6	8 51	19 10	9 9	19 4												
M.	5	4 5	3 8	9 4	3 24	9 3	2 18	24 0	2 35	23 5	9 26	18 10	9 42	18 4												
Tu.	6	4 48	3 40	9 1	3 57	8 11	2 51	22 10	3 8	22 2	9 57	17 9	10 13	17 2												
W.	7	5 32	4 15	8 9	4 35	8 7	3 26	21 6	3 46	20 10	10 33	16 7	10 51	15 11												
Th.	8	6 18	4 57	8 5	5 24	8 3	4 10	20 2	4 39	19 7	11 13	15 4	11 41	14 10												
F.	9	7 5	5 55	8 1	6 31	8 0	5 15	19 2	5 54	19 0	—	—	0 14	14 7												
S.	10	7 54	7 9	7 11	7 49	7 11	6 38	19 1	7 19	19 4	0 50	14 7	1 34	14 8												
Th.	11	8 44	8 27	8 1	9 4	8 3	7 57	19 10	8 34	20 6	2 16	15 0	2 57	15 7												
M.	12	9 36	9 38	8 5	10 5	8 8	9 3	21 2	9 28	22 0	3 32	16 3	4 2	17 2												
Tu.	13	10 28	10 30	8 10	10 53	9 1	9 51	22 11	10 13	23 9	4 30	18 0	4 55	18 9												
W.	14	11 21	11 15	9 3	11 37	9 5	10 32	24 7	10 52	25 3	5 19	19 7	5 42	20 3												
Th.	15	0 a 13	11 59	9 7	—	—	11 12	25 10	11 32	26 5	6 4	20 10	6 24	21 5												
F.	16	1 6	0 20	9 10	0 40	10 0	11 52	27 0	—	—	6 43	21 10	7 3	22 3												
S.	17	1 59	1 0	10 1	1 21	10 2	0 12	27 4	0 33	27 7	7 23	22 5	7 44	22 5												
Th.	18	2 52	1 43	10 3	2 4	10 3	0 54	27 8	1 14	27 6	8 4	22 4	8 25	22 1												
M.	19	3 46	2 25	10 2	2 45	10 1	1 35	27 3	1 55	26 9	8 46	21 9	9 8	21 3												
Tu.	20	4 40	3 6	9 11	3 28	9 9	2 17	26 2	2 40	25 6	9 31	20 8	9 52	19 11												
W.	21	5 36	3 50	9 7	4 12	9 5	3 1	24 8	3 23	23 10	10 12	19 2	10 34	18 5												
Th.	22	6 32	4 37	9 2	5 5	8 11	3 48	22 11	4 19	22 1	10 59	17 7	11 25	16 9												
F.	23	7 28	5 36	8 8	6 13	8 6	4 53	21 3	5 34	20 9	11 58	16 2	—	—												
S.	24	8 24	6 55	8 4	7 40	8 3	6 21	20 6	7 10	20 8	0 37	15 11	1 23	15 10												
Th.	25	9 18	8 23	8 5	9 3	8 7	7 52	21 0	8 32	21 7	2 11	16 1	2 55	16 7												
M.	26	10 9	9 39	8 9	10 9	8 11	9 4	22 4	9 32	23 1	3 34	17 4	4 7	18 1												
Tu.	27	10 59	10 36	9 1	10 59	9 3	9 56	23 9	10 17	24 5	4 35	18 9	5 1	19 4												
W.	28	11 46	11 21	9 4	11 44	9 5	10 37	24 10	10 57	25 3	5 25	19 10	5 48	20 3												
Half Mean Spring Range.			4ft. 10in.								13ft. 0in.								10ft. 6in.							

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	7	7	39	Afternoon.
New - - - - -	15	10	13	Morning.
First Quarter -	22	4	48	Morning.
In Apogee - -	6	8	0	Afternoon.
In Perigee - -	18	4	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	7	N.31	9	17	S.37	17	0	S.11	25	17	N.2
2	4	0	10	18	25	18	4	N.21	26	14	57
3	0	S.15	11	18	21	19	8	38	27	12	7
4	4	5	12	17	20	20	12	23	28	8	44
5	7	42	13	15	22	21	15	22			
6	10	58	14	12	31	22	17	23			
7	13	47	15	8	53	23	18	21			
8	16	3	16	4	42	24	18	12			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				CLOCK AGE.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
Th.	1	7 50	37 8	8 8	37 8	11 2	16 2	11 20	16 2	—	—	0 3	11 1	15
F.	2	8 26	37 5	8 42	37 2	11 38	16 0	11 56	15 10	0 23	11 0	0 42	10 11	16
S.	3	8 58	36 9	9 14	36 3	—	—	0 14	15 7	0 59	10 9	1 17	10 8	17
Th.	4	9 30	35 9	9 46	34 11	0 33	15 4	0 52	15 1	1 36	10 6	1 53	10 3	18
M.	5	10 1	34 2	10 15	33 4	1 11	14 9	1 30	14 5	2 12	10 1	2 30	9 11	19
Tu.	6	10 28	32 4	10 42	31 4	1 49	14 1	2 8	13 8	2 49	9 9	3 7	9 6	20
W.	7	10 59	30 4	11 19	29 3	2 28	13 4	2 51	12 11	3 26	9 4	3 49	9 1	
Th.	8	11 44	28 4	—	—	3 16	12 7	3 47	12 3	4 15	8 10	4 45	8 8	22
F.	9	0 15	27 8	0 50	27 2	4 24	12 0	5 2	11 11	5 19	8 6	5 54	8 5	23
S.	10	1 29	27 1	2 9	27 3	5 42	12 0	6 20	12 2	6 31	8 6	7 7	8 8	24
Th.	11	2 49	27 10	3 30	28 8	6 56	12 5	7 30	12 9	7 43	8 10	8 18	9 1	25
M.	12	4 7	29 7	4 39	30 10	7 59	13 2	8 24	13 7	8 50	9 3	9 17	9 6	26
Tu.	13	5 8	32 2	5 36	33 6	8 47	14 2	9 8	14 8	9 43	9 10	10 7	10 1	27
W.	14	6 0	34 10	6 23	36 0	9 27	15 2	9 46	15 7	10 26	10 5	10 44	10 8	28
Th.	15	6 45	36 11	7 6	37 9	10 5	16 0	10 24	16 4	11 3	10 11	11 21	11 2	
F.	16	7 26	38 7	7 46	39 3	10 42	16 7	11 0	16 10	11 40	11 4	11 59	11 5	
S.	17	8 7	39 7	8 27	39 8	11 19	16 11	11 39	16 11	—	—	0 21	11 5	
Th.	18	8 47	39 7	9 7	39 4	12 0	16 10	—	—	0 43	11 5	1 4	11 4	
M.	19	9 26	38 10	9 46	38 2	0 22	16 8	0 45	16 5	1 26	11 2	1 48	11 0	
Tu.	20	10 6	37 2	10 24	36 0	1 9	16 1	1 35	15 8	2 11	10 10	2 35	10 7	
W.	21	10 41	34 8	11 2	33 4	1 59	15 2	2 24	14 8	2 59	10 4	3 24	10 1	
Th.	22	11 27	31 11	11 57	30 9	2 52	14 2	3 24	13 8	3 50	9 10	4 23	9 6	
F.	23	—	—	0 33	29 9	4 1	13 3	4 43	13 0	4 59	9 3	5 37	9 1	
S.	24	1 14	29 3	2 1	29 3	5 28	12 11	6 11	13 0	6 17	9 0	6 58	9 1	
Th.	25	2 45	29 7	3 28	30 3	6 51	13 2	7 28	13 5	7 38	9 3	8 16	9 5	
M.	26	4 9	31 3	4 45	32 1	8 0	13 10	8 28	14 3	8 51	9 8	9 22	9 11	
Tu.	27	5 15	33 6	5 42	34 6	8 52	14 8	9 12	15 0	9 49	10 1	10 12	10 4	
W.	28	6 6	35 4	6 29	36 0	9 32	15 4	9 52	15 7	10 31	10 6	10 49	10 8	
Half Mean Spring } Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	13 53	Sub.	9	14 29	Sub.	17	14 17	Sub.	25	13 19	Sub.
2	14 0		10	14 30		18	14 12		26	13 8	
3	14 7		11	14 31		19	14 6		27	12 58	
4	14 13		12	14 30		20	14 0		28	12 46	
5	14 18		13	14 29		21	13 53				
6	14 22		14	14 27		22	13 45				
7	14 25		15	14 24		23	13 37				
8	14 28		16	14 21		24	13 28				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.														
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.											
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.										
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.											
Th.	1	1m 6	11 40	9 6	11 58	9 6	8 53	7 10	9 10	7 9	6 10	11 4	6 28	11 4															
F.	2	1 53	—	—	0 17	9 5	9 27	7 8	9 43	7 6	6 47	11 2	7 5	11 0															
S.	3	2 38	0 35	9 5	0 53	9 4	9 59	7 4	10 16	7 2	7 22	10 9	7 40	10 6															
S.	4	3 22	1 12	9 3	1 30	9 2	10 33	7 0	10 51	6 10	7 57	10 2	8 14	9 11															
M.	5	4 5	1 50	9 0	2 10	8 11	11 9	6 7	11 30	6 4	8 31	9 7	8 49	9 4															
Tu.	6	4 48	2 30	8 9	2 50	8 7	11 53	6 1	—	—	9 9	9 0	9 31	8 9															
W.	7	5 32	3 10	8 5	3 33	8 3	0 18	5 10	0 48	5 7	9 57	8 6	10 24	8 3															
Th.	8	6 18	3 57	8 2	4 26	8 0	1 19	5 5	1 56	5 4	10 56	8 0	11 32	7 11															
F.	9	7 5	5 0	7 11	5 36	7 10	2 36	5 3	3 13	5 4	—	—	0 9	7 11															
S.	10	7 54	6 12	7 10	6 51	7 10	3 50	5 6	4 24	5 8	0 47	7 11	1 25	8 0															
S.	11	8 44	7 28	7 11	8 4	8 0	4 54	5 10	5 24	6 1	2 1	8 2	2 37	8 5															
M.	12	9 36	8 34	8 2	8 58	8 5	5 49	6 3	6 10	6 6	3 6	8 9	3 29	9 2															
Tu.	13	10 28	9 21	8 8	9 43	8 11	6 31	6 9	6 53	7 0	3 50	9 7	4 10	10 0															
W.	14	11 21	10 2	9 2	10 22	9 4	7 14	7 3	7 35	7 6	4 29	10 6	4 48	10 10															
Th.	15	0a 13	10 41	9 6	11 0	9 7	7 56	7 8	8 14	7 11	5 9	11 2	5 29	11 6															
F.	16	1 6	11 18	9 8	11 37	9 9	8 32	8 1	8 50	8 2	5 48	11 8	6 7	11 10															
S.	17	1 59	11 57	9 9	—	—	9 9	8 2	9 28	8 1	6 27	11 11	6 48	11 10															
S.	18	2 52	0 18	9 9	0 40	9 9	9 48	8 0	10 8	7 11	7 9	11 8	7 30	11 6															
M.	19	3 46	1 2	9 8	1 24	9 7	10 27	7 9	10 49	7 6	7 51	11 3	8 13	10 11															
Tu.	20	4 40	1 48	9 6	2 14	9 4	11 14	7 3	11 41	7 0	8 36	10 6	9 0	10 2															
W.	21	5 36	2 40	9 2	3 6	8 11	—	—	0 11	6 8	9 26	9 9	9 57	9 5															
Th.	22	6 32	3 34	8 9	4 6	8 6	0 46	6 3	1 27	6 0	10 33	9 1	11 10	8 9															
F.	23	7 28	4 40	8 4	5 18	8 3	2 10	5 11	2 55	5 10	11 51	8 7	—	—															
S.	24	8 24	5 58	8 2	6 42	8 1	3 36	5 11	4 16	6 1	0 33	8 6	1 16	8 7															
S.	25	9 18	7 24	8 2	8 2	8 3	4 50	6 3	5 21	6 5	1 57	8 9	2 35	9 0															
M.	26	10 9	8 34	8 5	9 1	8 8	5 48	6 8	6 13	6 10	3 6	9 4	3 32	9 8															
Tu.	27	10 59	9 26	8 11	9 47	9 1	6 36	7 0	6 58	7 2	3 54	10 0	4 14	10 4															
W.	28	11 46	10 8	9 3	10 28	9 4	7 20	7 4	7 41	7 6	4 34	10 7	4 54	10 10															
Half Mean Spring } Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.														
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'			
Last Quarter - 7 7 39 Afternoon.															1	7	N.31	9	17	S.37	17	0	S.11	25	27	N. 2			
New - - - - 15 10 13 Morning.															2	4	0	10	18	25	18	4	N.21	26	14	57			
First Quarter - 22 4 48 Morning.															3	0	S.15	11	18	21	19	8	38	27	12	7			
															4	4	5	12	17	20	20	12	23	28	8	44			
In Apogee - - 6 8 0 Afternoon.															5	7	42	13	15	22	21	15	22						
In Perigee - - 18 4 0 Afternoon.															6	10	58	14	12	31	22	17	23						
															7	13	47	15	8	53	23	18	21						
															8	16	3	16	4	42	24	18	12						

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

FEBRUARY, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.					
H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.		
Th.	1	5	30	15	0	5	49	15	0	5	57	11	11	6	16	11	11	6	17	12	7	6	36	12	7	15.6
F.	2	6	8	14	10	6	25	14	8	6	34	11	10	6	51	11	8	6	55	12	6	7	13	12	5	16.6
S.	3	6	42	14	5	7	1	14	2	7	8	11	6	7	26	11	4	7	30	12	4	7	47	12	2	17.6
S.	4	7	18	13	10	7	37	13	6	7	42	11	2	8	0	10	11	8	3	12	0	8	19	11	10	18.6
M.	5	7	55	13	2	8	14	12	9	8	16	10	8	8	32	10	5	8	35	11	8	8	51	11	5	19.6
Tu.	6	8	32	12	2	8	51	11	8	8	48	10	1	9	4	9	9	9	5	11	1	9	20	10	10	20.6
W.	7	9	13	11	3	9	36	10	9	9	24	9	6	9	44	9	3	9	38	10	6	10	0	10	3	21.6
Th.	8	10	5	10	5	10	40	10	3	10	8	9	0	10	39	8	9	10	28	9	11	11	1	9	8	22.6
F.	9	11	17	10	1	11	58	10	2	11	16	8	8	11	55	8	7	11	36	9	5	—	—	—	—	23.6
S.	10	—	—	—	—	0	37	10	4	—	—	—	—	0	35	8	8	0	12	9	4	0	48	9	5	24.6
S.	11	1	13	10	7	1	48	11	0	1	14	8	11	1	53	9	2	1	25	9	7	2	2	9	10	25.6
M.	12	2	18	11	6	2	42	12	0	2	28	9	5	2	57	9	9	2	38	10	2	3	9	10	7	26.6
Tu.	13	3	5	12	7	3	28	13	1	3	22	10	2	3	46	10	7	3	37	11	0	4	4	11	4	27.6
W.	14	3	48	13	8	4	8	14	2	4	9	11	0	4	31	11	4	4	28	11	9	4	52	12	1	28.6
Th.	15	4	28	14	8	4	47	15	1	4	52	11	8	5	12	11	11	5	15	12	4	5	35	12	7	29.6
F.	16	5	6	15	5	5	26	15	9	5	32	12	2	5	53	12	4	5	53	12	10	6	13	13	0	1.1
S.	17	5	47	15	11	6	9	15	11	6	14	12	5	6	35	12	6	6	35	13	2	6	56	13	3	2.1
S.	18	6	30	15	9	6	51	15	7	6	56	12	5	7	17	12	4	7	17	13	2	7	38	13	1	3.1
M.	19	7	13	15	4	7	36	14	11	7	38	12	1	7	59	11	10	7	58	13	0	8	19	12	9	4.1
Tu.	20	8	0	14	6	8	24	13	11	8	21	11	7	8	42	11	3	8	40	12	7	9	0	12	2	5.1
W.	21	8	48	13	3	9	15	12	8	9	3	10	10	9	26	10	5	9	19	11	10	9	40	11	5	6.1
Th.	22	9	45	12	0	10	19	11	7	9	52	10	0	10	21	9	8	10	8	11	0	10	42	10	7	7.1
F.	23	10	59	11	3	11	43	11	2	10	58	9	5	11	40	9	3	11	19	10	3	11	58	10	0	8.1
S.	24	—	—	—	—	0	28	11	2	—	—	—	—	0	26	9	3	—	—	—	—	0	39	10	0	9.1
S.	25	1	9	11	5	1	46	11	9	1	9	9	5	1	52	9	8	1	20	10	2	2	0	10	4	10.1
M.	26	2	17	12	3	2	46	12	8	2	30	9	11	3	1	10	3	2	40	10	8	3	15	11	0	11.1
Tu.	27	3	11	13	1	3	34	13	6	3	29	10	7	3	53	10	11	3	44	11	4	4	11	11	8	12.1
W.	28	3	54	13	10	4	14	14	2	4	15	11	2	4	37	11	4	4	35	11	11	4	58	12	1	13.1
Half Mean Spring Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	13	53	Sub.	9	14	29	Sub.	17	14	17	Sub.	25	13	19	Sub.
2	14	0		10	14	30		18	14	12		26	13	8	
3	14	7		11	14	31		19	14	6		27	12	58	
4	14	13		12	14	30		20	14	0		28	12	46	
5	14	18		13	14	29		21	13	53					
6	14	22		14	14	27		22	13	45					
7	14	25		15	14	24		23	13	37					
8	14	28		16	14	21		24	13	28					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required — for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Th.	1	morn.	3 43	18 10	4 0	19 1	5 35	15 5	5 55	15 0	11 39	12 6	11 56	12 8
F.	2	0 32	4 17	19 2	4 34	19 3	6 13	15 8	6 31	15 3	—	—	0 14	12 9
S.	3	1 16	4 51	19 2	5 7	19 1	6 49	15 8	7 6	15 2	0 32	12 9	0 49	12 8
♄.	4	2 0	5 23	18 11	5 38	18 7	7 19	15 4	7 34	14 11	1 7	12 7	1 23	12 6
M.	5	2 43	5 52	18 3	6 8	17 11	7 47	14 9	8 2	14 5	1 39	12 5	1 55	12 3
Tu.	6	3 27	6 25	17 6	6 41	16 11	8 17	14 1	8 32	13 9	2 9	12 1	2 25	11 10
W.	7	4 12	6 58	16 4	7 17	15 8	8 45	13 5	9 0	13 2	2 42	11 7	2 59	11 4
Th.	8	4 58	7 37	15 0	7 57	14 4	9 16	12 9	9 36	12 6	3 17	11 1	3 36	10 10
F.	9	5 45	8 20	13 8	8 47	13 3	9 57	12 0	10 21	12 0	3 55	10 6	4 17	10 2
S.	10	6 34	9 21	12 10	9 59	12 8	10 49	11 6	11 20	11 9	4 43	9 11	5 15	9 8
♄.	11	7 24	10 44	12 9	11 29	13 0	11 59	11 4	—	—	5 52	9 6	6 34	9 6
M.	12	8 15	—	—	0 10	13 6	0 42	11 11	1 24	11 9	7 18	9 8	7 57	9 11
Tu.	13	9 7	0 46	14 2	1 17	15 0	2 5	12 9	2 43	12 7	8 35	10 4	9 8	10 10
W.	14	9 59	1 45	15 11	2 8	16 11	3 17	13 9	3 48	13 8	9 37	11 3	10 2	11 9
Th.	15	10 52	2 30	17 10	2 50	18 9	4 15	14 9	4 40	14 7	10 25	12 2	10 46	12 7
F.	16	11 45	3 10	19 6	3 30	20 2	5 4	15 7	5 27	15 5	11 6	12 11	11 26	13 2
S.	17	0a39	3 50	20 7	4 11	20 11	5 49	16 3	6 11	16 1	11 46	13 5	—	—
♄.	18	1 34	4 33	21 1	4 55	21 2	6 34	16 8	6 56	16 5	0 8	13 7	0 30	13 8
M.	19	2 31	5 16	21 1	5 37	20 9	7 16	16 7	7 36	16 3	0 53	13 8	1 16	13 7
Tu.	20	3 28	5 59	20 4	6 21	19 9	7 58	16 2	8 20	15 10	1 38	13 5	2 0	13 3
W.	21	4 26	6 44	19 0	7 7	18 2	8 41	15 7	9 2	15 2	2 22	13 0	2 45	12 8
Th.	22	5 24	7 32	17 2	7 59	16 3	9 25	14 8	9 49	14 4	3 8	12 3	3 32	11 10
F.	23	6 20	8 28	15 3	9 1	14 7	10 16	13 7	10 43	13 5	3 57	11 5	4 25	11 0
S.	24	7 14	9 38	14 1	10 22	13 10	11 14	12 8	11 49	12 10	4 57	10 7	5 32	10 3
♄.	25	8 6	11 8	13 10	11 54	14 1	—	—	0 31	12 2	6 13	10 1	6 57	10 0
M.	26	8 56	—	—	0 32	14 6	1 13	12 10	1 55	12 6	7 41	10 3	8 21	10 6
Tu.	27	9 43	1 5	15 0	1 34	15 7	2 33	13 4	3 7	13 1	8 56	10 10	9 26	11 2
W.	28	10 28	1 59	16 4	2 21	16 11	3 36	14 1	4 3	13 10	9 53	11 6	10 16	11 9
Th.	29	11 12	2 40	17 6	2 58	18 0	4 28	14 8	4 49	14 6	10 36	12 0	10 54	12 2
F.	30	11 56	3 15	18 5	3 32	18 8	5 10	15 2	5 28	14 11	11 11	12 4	11 29	12 5
S.	31	morn.	3 49	18 10	4 6	18 11	5 46	15 5	6 3	15 2	11 45	12 6	—	—
Half Mean Spring } Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.} 4 ^{in.}			

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
Full - - - - -	1	11	52	Morning.	1	5	N. 1	9	18	S. 4	17	2	N. 33	25	15	N. 25
Last Quarter -	9	3	53	Afternoon.	2	1	9	10	18	19	18	7	4	26	12	47
New- - - - -	16	9	37	Afternoon.	3	2	S. 43	11	17	42	19	11	9	27	9	35
First Quarter-	23	1	2	Afternoon.	4	6	24	12	16	10	20	14	29	28	6	1
Full - - - - -	31	4	31	Morning.	5	9	48	13	13	44	21	16	50	29	2	13
					6	12	46	14	10	28	22	18	6	30	1	S. 37
In Apogee - -	6	3	0	Afternoon.	7	15	12	15	6	31	23	18	13	31	5	20
In Perigee - -	18	2	0	Afternoon.	8	17	0	16	2	5	24	17	17			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	D.						
Th.	1	11 8	18 5	11 28	18 7	0 37	15 8	0 56	15 10	2 6	18 4	2 26	18 7	○												
F.	2	11 46	18 9	—	—	1 15	16 0	1 33	16 2	2 45	18 11	3 4	19 1	15.1												
S.	3	0 5	18 10	0 23	18 10	1 50	16 3	2 7	16 3	3 21	19 2	3 36	19 3	16.1												
S.	4	0 41	18 9	0 59	18 7	2 22	16 2	2 38	16 1	3 52	19 3	4 7	19 3	17.1												
M.	5	1 16	18 5	1 32	18 2	2 54	15 11	3 8	15 10	4 24	19 1	4 40	18 11	18.1												
Tu.	6	1 49	17 11	2 6	17 7	3 23	15 7	3 37	15 4	4 56	18 9	5 9	18 6	19.1												
W.	7	2 23	17 2	2 40	16 9	3 54	15 1	4 11	14 9	5 24	18 3	5 41	17 11	20.1												
Th.	8	2 58	16 3	3 17	15 9	4 29	14 5	4 47	14 0	5 58	17 7	6 15	17 2	21.1												
F.	9	3 38	15 3	3 59	14 9	5 7	13 8	5 29	13 4	6 37	16 9	6 58	16 4	22.1												
S.	10	4 23	14 3	4 52	13 10	5 53	13 0	6 23	12 9	7 23	16 0	7 51	15 9	23.1												
S.	11	5 25	13 7	6 4	13 7	7 0	12 6	7 40	12 5	8 27	15 5	9 8	15 3	24.1												
M.	12	6 44	13 10	7 23	14 3	8 25	12 7	9 9	12 10	9 50	15 3	10 31	15 5	25.1												
Tu.	13	8 1	14 11	8 33	15 7	9 48	13 2	10 23	13 8	11 12	15 8	11 48	16 0	26.1												
W.	14	9 0	16 4	9 25	17 1	10 52	14 1	11 19	14 7	—	—	0 20	16 6	27.1												
Th.	15	9 48	17 9	10 10	18 5	11 41	15 2	—	—	0 47	17 1	1 10	17 8	28.1												
F.	16	10 32	19 0	10 54	19 6	0 2	15 7	0 23	16 0	1 32	18 3	1 55	18 9	29.1												
S.	17	11 18	19 10	11 41	20 2	0 43	16 5	1 3	16 9	2 15	19 3	2 34	19 8	0.6												
S.	18	—	—	0 4	20 4	1 23	17 0	1 44	17 2	2 54	20 0	3 14	20 3	1.6												
M.	19	0 27	20 5	0 50	20 4	2 5	17 3	2 26	17 3	3 36	20 6	3 57	20 6	2.6												
Tu.	20	1 14	20 1	1 38	19 10	2 47	17 2	3 7	17 0	4 18	20 6	4 39	20 3	3.6												
W.	21	2 2	19 5	2 25	18 11	3 28	16 9	3 51	16 5	5 1	20 0	5 24	19 8	4.6												
Th.	22	2 49	18 3	3 13	17 6	4 14	15 11	4 37	15 5	5 47	19 2	6 9	18 8	5.6												
F.	23	3 38	16 9	4 6	16 0	5 2	14 11	5 31	14 5	6 33	18 1	7 1	17 6	6.6												
S.	24	4 36	15 4	5 8	14 9	6 2	13 11	6 39	13 6	7 30	17 0	8 5	16 6	7.6												
S.	25	5 44	14 6	6 24	14 6	7 18	13 3	8 4	13 2	8 48	16 2	9 31	16 0	8.6												
M.	26	7 7	14 9	7 47	15 2	8 49	13 3	9 32	13 6	10 14	15 11	10 57	16 0	9.6												
Tu.	27	8 21	15 8	8 50	16 1	9 13	10 10	10 41	14 2	11 36	16 3	—	—	10.6												
W.	28	9 16	16 7	9 39	17 0	11 8	14 5	11 33	14 10	0 9	16 7	0 37	16 11	11.6												
Th.	29	10 0	17 5	10 20	17 9	11 54	15 1	—	—	1 2	17 4	1 25	17 8	12.6												
F.	30	10 39	18 1	10 57	18 3	0 13	15 4	0 31	15 7	1 45	18 0	2 2	18 3	13.6												
S.	31	11 16	18 5	11 35	18 6	0 48	15 9	1 6	15 11	2 18	18 6	2 36	18 9	○												
Half Mean Spring } Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.																

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	35	Sub.	9	10	44	Sub.	17	8	32	Sub.	25	6	7	Sub.
2	12	22		10	10	29		18	8	14		26	5	48	
3	12	10		11	10	13		19	7	56		27	5	30	
4	11	56		12	9	57		20	7	38		28	5	11	
5	11	43		13	9	40		21	7	20		29	4	53	
6	11	29		14	9	23		22	7	2		30	4	34	
7	11	14		15	9	6		23	6	44		31	4	16	
8	10	59		16	8	49		24	6	25					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.					
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.		
			Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.	
Th.	1	morn.	—	—		0 9	11 6		6 25	20 5		6 45	20 8		3 21	13 11		3 39	14 2	
F.	2	0 32	0 29	11 7		0 46	11 8		7 4	20 10		7 21	21 0		3 56	14 4		4 12	14 5	
S.	3	1 16	1 3	11 8		1 20	11 8		7 39	21 0		7 56	21 0		4 29	14 6		4 45	14 6	
S.	4	2 0	1 37	11 7		1 53	11 6		8 11	20 11		8 27	20 9		5 1	14 5		5 17	14 3	
M.	5	2 43	2 9	11 4		2 25	11 3		8 43	20 6		8 58	20 2		5 33	14 0		5 48	13 9	
Tu.	6	3 27	2 40	11 1		2 56	10 11		9 14	19 9		9 31	19 4		6 4	13 5		6 22	13 1	
W.	7	4 12	3 13	10 9		3 29	10 7		9 47	18 10		10 4	18 4		6 40	12 9		6 59	12 5	
Th.	8	4 58	3 46	10 4		4 3	10 2		10 23	17 10		10 43	17 3		7 19	12 1		7 39	11 8	
F.	9	5 45	4 22	9 11		4 42	9 9		11 8	16 9		11 35	16 3		8 1	11 4		8 25	11 0	
S.	10	6 34	5 6	9 7		5 33	9 5		—	—		0 8	15 10		8 55	10 8		9 31	10 5	
S.	11	7 24	6 7	9 4		6 47	9 3		0 44	15 6		1 21	15 4		10 11	10 3		10 53	10 4	
M.	12	8 15	7 33	9 4		8 17	9 6		2 1	15 5		2 42	15 9		11 35	10 7		—	—	
Tu.	13	9 7	8 55	9 9		9 30	10 0		3 17	16 5		3 51	17 1		0 9	10 11		0 42	11 5	
W.	14	9 59	10 0	10 4		10 28	10 9		4 21	17 11		4 48	18 8		1 11	12 0		1 38	12 7	
Th.	15	10 52	10 52	11 1		11 14	11 4		5 10	19 6		5 31	20 2		2 3	13 2		2 26	13 8	
F.	16	11 45	11 36	11 8		11 56	11 11		5 51	20 9		6 12	21 4		2 48	14 1		3 7	14 6	
S.	17	0 39	—	—		0 16	12 1		6 33	21 9		6 54	22 2		3 26	14 11		3 46	15 3	
S.	18	1 34	0 36	12 2		0 56	12 3		7 15	22 6		7 37	22 8		4 7	15 6		4 27	15 9	
M.	19	2 31	1 18	12 4		1 40	12 3		7 59	22 8		8 20	22 8		4 48	15 9		5 10	15 7	
Tu.	20	3 28	2 1	12 2		2 23	12 0		8 42	22 4		9 4	21 11		5 32	15 4		5 54	15 0	
W.	21	4 26	2 46	11 10		3 9	11 7		9 27	21 4		9 50	20 8		6 18	14 6		6 42	14 1	
Th.	22	5 24	3 31	11 4		3 54	11 0		10 13	19 11		10 38	19 2		7 7	13 7		7 34	13 0	
F.	23	6 20	4 18	10 9		4 44	10 5		11 9	18 5		11 43	17 8		8 3	12 6		8 34	11 11	
S.	24	7 14	5 14	10 2		5 47	9 11		—	—		0 23	17 0		9 10	11 6		9 49	11 2	
S.	25	8 6	6 25	9 10		7 11	9 9		1 3	16 7		1 41	16 5		10 32	11 0		11 15	11 1	
M.	26	8 56	7 56	9 10		8 39	10 0		2 21	16 6		3 1	16 10		11 54	11 3		—	—	
Tu.	27	9 43	9 16	10 2		9 48	10 5		3 37	17 5		4 10	17 11		0 29	11 7		1 0	12 0	
W.	28	10 28	10 17	10 7		10 43	10 10		4 37	18 5		5 2	19 0		1 27	12 4		1 54	12 9	
Th.	29	11 12	11 5	11 0		11 25	11 3		5 22	19 5		5 41	19 9		2 17	13 1		2 37	13 4	
F.	30	11 56	11 44	11 4		—	—		6 0	20 1		6 18	20 3		2 56	13 7		3 13	13 10	
S.	31	morn.	0 1	11 5		0 19	11 6		6 36	20 6		6 53	20 7		3 29	14 0		3 45	14 2	

Half Mean Spring } 5ft. 9in.
Range.

10^{ft.} 5^{in.}

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - - -	1	11	52	Morning.
Last Quarter -	9	3	53	Afternoon.
New - - - - -	16	9	37	Afternoon.
First Quarter -	23	1	2	Afternoon.
Full - - - - -	31	4	31	Morning.
<hr/>				
In Apogee - -	6	3	0	Afternoon.
In Perigee - -	18	2	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	5	N. 1	9	18	S. 4	17	2	N. 33	25	15	N. 25
2	1	9	10	18	19	18	7	4	26	12	47
3	2	S. 43	11	17	42	19	11	9	27	9	35
4	6	24	12	16	10	20	14	29	28	6	1
5	9	48	13	13	44	21	16	50	29	2	13
6	12	46	14	10	28	22	18	6	30	1	S. 37
7	15	12	15	6	31	23	18	13	31	5	20
8	17	0	16	2	5	24	17	17			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH *subtract 5 m.* **HULL** *add 1 m.* **SUNDERLAND** *add 5 m.*

MARCH, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	D.																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Th.	1	3 21	12 10	3 39	13 1	2 19	15 11	2 38	16 2	8 26	13 2	8 43	13 4	○	F.	2	3 56	13 3	4 13	13 4	2 55	16 4	3 10	16 5	8 59	13 5	9 15	13 5	15' 1	S.	3	4 30	13 4	4 47	13 3	3 26	16 5	3 42	16 4	9 31	13 3	9 48	13 2	16' 1	S.	4	5 4	13 1	5 20	12 11	3 58	16 2	4 15	16 0	10 5	13 0	10 21	12 9	17' 1	M.	5	5 36	12 9	5 52	12 6	4 31	15 9	4 47	15 6	10 37	12 6	10 53	12 2	18' 1	Tu.	6	6 9	12 3	6 26	12 0	5 3	15 3	5 20	14 11	11 11	11 10	11 30	11 4	19' 1	W.	7	6 43	11 8	7 1	11 4	5 38	14 7	5 57	14 2	11 49	11 0	—	—	20' 1	Th.	8	7 20	11 0	7 42	10 7	6 17	13 9	6 38	13 4	0 8	10 7	0 29	10 2	21' 1	F.	9	8 6	10 2	8 32	9 9	7 0	12 11	7 27	12 6	0 52	9 9	1 17	9 5	○	S.	10	9 4	9 6	9 42	9 3	7 58	12 2	8 35	11 11	1 49	9 1	2 26	8 10	23' 1	S.	11	10 23	9 3	11 5	9 4	9 16	11 9	10 0	11 11	3 9	8 9	3 57	8 9	24' 1	M.	12	11 47	9 7	—	—	10 41	12 2	11 16	12 6	4 40	8 11	5 18	9 2	25' 1	Tu.	13	0 23	9 11	0 56	10 4	11 49	12 11	—	—	5 51	9 7	6 19	10 2	26' 1	W.	14	1 23	10 10	1 48	11 4	0 18	13 6	0 42	14 1	6 43	10 10	7 3	11 8	27' 1	Th.	15	2 9	11 11	2 30	12 5	1 4	14 10	1 25	15 5	7 21	12 4	7 38	13 0	28' 1	F.	16	2 50	13 0	3 8	13 5	1 46	16 1	2 5	16 7	7 54	13 7	8 13	14 1	●	S.	17	3 27	13 10	3 47	14 2	2 25	17 1	2 45	17 5	8 33	14 5	8 52	14 7	0' 6	S.	18	4 7	14 5	4 28	14 6	3 4	17 7	3 24	17 8	9 13	14 8	9 35	14 7	1' 6	M.	19	4 50	14 5	5 13	14 4	3 46	17 8	4 7	17 6	9 57	14 6	10 20	14 2	2' 6	Tu.	20	5 35	14 1	5 58	13 9	4 30	17 3	4 53	16 11	10 43	13 10	11 7	13 4	3' 6	W.	21	6 22	13 5	6 45	13 0	5 16	16 6	5 40	16 0	11 32	12 10	11 57	12 3	4' 6	Th.	22	7 9	12 6	7 36	11 11	6 5	15 5	6 33	14 10	—	—	0 24	11 8	5' 6	F.	23	8 7	11 4	8 40	10 9	7 2	14 2	7 35	13 7	0 54	11 0	1 26	10 6	○	S.	24	9 20	10 4	10 2	10 1	8 14	13 1	8 54	12 9	2 5	10 0	2 47	9 9	7' 6	S.	25	10 44	10 0	11 27	10 1	9 39	12 8	10 21	12 8	3 34	9 7	4 20	9 6	8' 6	M.	26	—	—	0 8	10 4	11 1	12 10	11 36	13 2	5 2	9 7	5 38	9 10	9' 6	Tu.	27	0 43	10 7	1 12	10 10	—	—	0 7	13 6	6 8	10 2	6 34	10 8	10' 6	W.	28	1 38	11 2	2 1	11 6	0 32	13 11	0 55	14 5	6 55	11 2	7 13	11 8	11' 6	Th.	29	2 21	11 11	2 40	12 3	1 16	14 10	1 36	15 3	7 30	12 1	7 45	12 6	12' 6	F.	30	2 57	12 6	3 13	12 9	1 54	15 7	2 10	15 10	8 0	12 10	8 16	13 0	13' 6	S.	31	3 30	12 11	3 46	13 0	2 27	16 0	2 44	16 2	8 32	13 2	8 47	13 2	○
Half Mean Spring } Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.																																																																																																																																																																																																																																																																																																																																																																																																																																																														

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	35	Sub.	9	10	44	Sub.	17	8	32	Sub.	25	6	7	Sub.
2	12	22		10	10	29		18	8	14		26	5	48	
3	12	10		11	10	13		19	7	56		27	5	30	
4	11	56		12	9	57		20	7	38		28	5	11	
5	11	43		13	9	40		21	7	20		29	4	53	
6	11	29		14	9	23		22	7	2		30	4	34	
7	11	14		15	9	6		23	6	44		31	4	16	
8	10	59		16	8	49		24	6	25					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
Th.	1	morn.	—	—	0 4	9 7	11 17	25 7	11 36	25 11	6 9	20 7	6 28	20 11
F.	2	0 32	0 24	9 8	0 42	9 9	11 53	26 1	—	—	6 44	21 1	7 1	21 2
S.	3	1 16	0 59	9 9	1 16	9 9	0 11	26 2	0 28	26 2	7 17	21 2	7 33	21 0
S.	4	2 0	1 33	9 9	1 49	9 9	0 44	26 0	1 0	25 10	7 50	20 10	8 5	20 6
M.	5	2 43	2 4	9 8	2 20	9 7	1 15	25 6	1 30	25 1	8 20	20 2	8 36	19 10
Tu.	6	3 27	2 35	9 6	2 51	9 4	1 45	24 7	2 1	24 0	8 53	19 4	9 9	18 10
W.	7	4 12	3 7	9 2	3 23	9 0	2 17	23 4	2 34	22 9	9 25	18 3	9 42	17 8
Th.	8	4 58	3 40	8 11	3 59	8 9	2 51	22 2	3 10	21 6	9 59	17 1	10 17	16 6
F.	9	5 45	4 19	8 7	4 41	8 5	3 30	20 9	3 53	20 1	10 36	15 10	10 59	15 3
S.	10	6 34	5 8	8 3	5 41	8 1	4 23	19 6	4 59	19 0	11 28	14 9	—	—
S.	11	7 24	6 18	7 11	7 0	7 10	5 40	18 10	6 27	19 0	0 1	14 6	0 41	14 6
M.	12	8 15	7 43	7 11	8 22	8 1	7 13	19 5	7 51	20 0	1 27	14 9	2 10	15 3
Tu.	13	9 7	8 58	8 4	9 30	8 7	8 27	20 10	8 55	21 10	2 50	15 11	3 24	16 10
W.	14	9 59	9 58	8 10	10 23	9 2	9 21	22 10	9 43	23 10	3 54	17 10	4 22	18 10
Th.	15	10 52	10 46	9 4	11 8	9 7	10 4	24 9	10 24	25 8	4 47	19 8	5 11	20 7
F.	16	11 45	11 30	9 9	11 52	9 11	10 43	26 5	11 4	27 0	5 34	21 3	5 56	21 11
S.	17	0a39	—	—	0 14	10 2	11 26	27 7	11 47	28 0	6 18	22 5	6 39	22 10
S.	18	1 34	0 35	10 3	0 58	10 4	—	—	0 9	28 3	7 0	23 1	7 22	23 1
M.	19	2 31	1 21	10 5	1 42	10 5	0 31	28 4	0 53	28 3	7 43	23 0	8 4	22 8
Tu.	20	3 28	2 3	10 4	2 25	10 3	1 14	27 11	1 36	27 4	8 26	22 2	8 49	21 8
W.	21	4 26	2 48	10 1	3 10	9 10	1 58	26 7	2 20	25 9	9 11	20 11	9 33	20 1
Th.	22	5 24	3 32	9 7	3 55	9 5	2 42	24 10	3 6	23 10	9 55	19 3	10 19	18 4
F.	23	6 20	4 21	9 2	4 49	8 11	3 32	22 10	4 2	21 10	10 44	17 5	11 12	16 7
S.	24	7 14	5 22	8 8	5 58	8 5	4 38	21 0	5 18	20 5	11 43	15 11	—	—
S.	25	8 6	6 39	8 3	7 23	8 2	6 4	20 2	6 52	20 3	0 21	15 8	1 5	15 7
M.	26	8 56	8 6	8 3	8 44	8 5	7 35	20 8	8 13	21 2	1 54	15 9	2 36	16 3
Tu.	27	9 43	9 18	8 7	9 47	8 9	8 44	21 10	9 11	22 6	3 12	16 10	3 43	17 6
W.	28	10 28	10 14	9 0	10 36	9 1	9 35	23 3	9 56	23 10	4 12	18 3	4 37	18 10
Th.	29	11 12	10 57	9 3	11 17	9 4	10 14	24 4	10 32	24 9	5 0	19 4	5 21	19 9
F.	30	11 56	11 36	9 5	11 55	9 6	10 49	25 1	11 7	25 4	5 40	20 2	5 59	20 5
S.	31	morn.	—	—	0 13	9 7	11 24	25 7	11 41	25 9	6 17	20 7	6 33	20 9
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '							
Full - - - - - 1 11 52 Morning.							1 5 N. 1 9 18 8 4 17 2 N. 33 25 15 N. 25							
Last Quarter - 9 3 53 Afternoon.							2 1 9 10 18 19 18 7 4 26 12 47							
New - - - - - 16 9 37 Afternoon.							3 2 S. 43 11 17 42 19 11 9 27 9 35							
First Quarter 23 1 2 Afternoon.							4 6 24 12 16 10 20 14 29 28 6 1							
Full - - - - - 31 4 31 Morning.							5 9 48 13 13 44 21 16 50 29 2 13							
							6 12 46 14 10 28 22 18 6 30 1 S. 37							
In Apogee - - 6 3 0 Afternoon.							7 15 12 15 6 31 23 18 13 31 5 20							
In Perigee - - 18 2 0 Afternoon.							8 17 0 16 2 5 24 17 17							

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.					
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.							
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.						
Th.	1	6 51 36 6	7 10 36 11	10 11 15 10	10 28 16 0	11 7 10 10	11 24 11 0	0	Th.	1	6 51 36 6	7 10 36 11	10 11 15 10	10 28 16 0	11 7 10 10	11 24 11 0	0		
F.	2	7 28 37 3	7 45 37 7	10 43 16 1	10 58 16 2	11 41 11 0	11 58 11 0	15.1	F.	2	7 28 37 3	7 45 37 7	10 43 16 1	10 58 16 2	11 41 11 0	11 58 11 0	15.1		
S.	3	8 1 37 6	8 17 37 4	11 13 16 1	11 28 15 11	—	—	0 15 11 0	16.1	S.	3	8 1 37 6	8 17 37 4	11 13 16 1	11 28 15 11	—	—	0 15 11 0	16.1
S.	4	8 33 37 1	8 47 36 9	11 45 15 10	—	—	0 32 10 11	0 49 10 10	17.1	S.	4	8 33 37 1	8 47 36 9	11 45 15 10	—	—	0 32 10 11	0 49 10 10	17.1
M.	5	9 2 36 3	9 16 35 8	0 2 15 8	0 18 15 5	1 5 10 8	1 21 10 6	18.1	M.	5	9 2 36 3	9 16 35 8	0 2 15 8	0 18 15 5	1 5 10 8	1 21 10 6	18.1		
Tu.	6	9 31 35 0	9 45 34 1	0 34 15 1	0 53 14 9	1 37 10 4	1 54 10 1	19.1	Tu.	6	9 31 35 0	9 45 34 1	0 34 15 1	0 53 14 9	1 37 10 4	1 54 10 1	19.1		
W.	7	10 0 33 3	10 14 32 3	1 12 14 5	1 31 14 0	2 12 9 11	2 31 9 8	20.1	W.	7	10 0 33 3	10 14 32 3	1 12 14 5	1 31 14 0	2 12 9 11	2 31 9 8	20.1		
Th.	8	10 28 31 3	10 44 30 2	1 50 13 7	2 11 13 3	2 50 9 6	3 10 9 3	21.1	Th.	8	10 28 31 3	10 44 30 2	1 50 13 7	2 11 13 3	2 50 9 6	3 10 9 3	21.1		
F.	9	11 3 29 2	11 28 28 3	2 33 12 10	2 58 12 6	3 32 9 1	3 57 8 10	22.1	F.	9	11 3 29 2	11 28 28 3	2 33 12 10	2 58 12 6	3 32 9 1	3 57 8 10	22.1		
S.	10	—	0 1 27 5	3 30 12 2	4 7 11 11	4 28 8 8	5 4 8 6	23.1	S.	10	—	0 1 27 5	3 30 12 2	4 7 11 11	4 28 8 8	5 4 8 6	23.1		
S.	11	0 38 26 11	1 19 27 0	4 49 11 10	5 33 11 11	5 41 8 5	6 22 8 6	24.1	S.	11	0 38 26 11	1 19 27 0	4 49 11 10	5 33 11 11	5 41 8 5	6 22 8 6	24.1		
M.	12	2 4 27 4	2 44 28 2	6 15 12 3	6 50 12 7	7 2 8 8	7 37 8 11	25.1	M.	12	2 4 27 4	2 44 28 2	6 15 12 3	6 50 12 7	7 2 8 8	7 37 8 11	25.1		
Tu.	13	3 22 29 2	3 59 30 6	7 23 13 0	7 51 13 6	8 11 9 2	8 42 9 6	26.1	Tu.	13	3 22 29 2	3 59 30 6	7 23 13 0	7 51 13 6	8 11 9 2	8 42 9 6	26.1		
W.	14	4 32 32 0	5 1 33 7	8 17 14 1	8 39 14 9	9 10 9 10	9 36 10 2	27.1	W.	14	4 32 32 0	5 1 33 7	8 17 14 1	8 39 14 9	9 10 9 10	9 36 10 2	27.1		
Th.	15	5 28 35 0	5 52 36 5	8 59 15 3	9 19 15 10	9 59 10 5	10 19 10 9	28.1	Th.	15	5 28 35 0	5 52 36 5	8 59 15 3	9 19 15 10	9 59 10 5	10 19 10 9	28.1		
F.	16	6 15 37 8	6 38 38 7	9 38 16 4	9 58 16 8	10 36 11 1	10 55 11 4	29.1	F.	16	6 15 37 8	6 38 38 7	9 38 16 4	9 58 16 8	10 36 11 1	10 55 11 4	29.1		
S.	17	7 0 39 5	7 22 40 1	10 18 17 0	10 37 17 3	11 15 11 6	11 35 11 8	0.6	S.	17	7 0 39 5	7 22 40 1	10 18 17 0	10 37 17 3	11 15 11 6	11 35 11 8	0.6		
S.	18	7 43 40 7	8 5 40 8	10 56 17 5	11 17 17 5	11 57 11 9	—	1.6	S.	18	7 43 40 7	8 5 40 8	10 56 17 5	11 17 17 5	11 57 11 9	—	—	1.6	
M.	19	8 26 40 7	8 46 40 2	11 37 17 4	12 0 17 1	0 20 11 8	0 41 11 7	2.6	M.	19	8 26 40 7	8 46 40 2	11 37 17 4	12 0 17 1	0 20 11 8	0 41 11 7	2.6		
Tu.	20	9 7 39 6	9 28 38 9	—	0 24 16 9	1 4 11 5	1 27 11 3	3.6	Tu.	20	9 7 39 6	9 28 38 9	—	0 24 16 9	1 4 11 5	1 27 11 3	3.6		
W.	21	9 48 37 7	10 7 36 3	0 49 16 4	1 14 15 10	1 51 11 0	2 15 10 8	4.6	W.	21	9 48 37 7	10 7 36 3	0 49 16 4	1 14 15 10	1 51 11 0	2 15 10 8	4.6		
Th.	22	10 26 34 9	10 47 33 3	1 39 15 3	2 6 14 8	2 39 10 5	3 5 10 1	5.6	Th.	22	10 26 34 9	10 47 33 3	1 39 15 3	2 6 14 8	2 39 10 5	3 5 10 1	5.6		
F.	23	11 11 31 8	11 42 30 4	2 35 14 1	3 7 13 7	3 34 9 9	4 5 9 5	6.6	F.	23	11 11 31 8	11 42 30 4	2 35 14 1	3 7 13 7	3 34 9 9	4 5 9 5	6.6		
S.	24	—	0 18 29 4	3 46 13 1	4 27 12 9	4 43 9 2	5 22 8 11	7.6	S.	24	—	0 18 29 4	3 46 13 1	4 27 12 9	4 43 9 2	5 22 8 11	7.6		
S.	25	0 58 28 10	1 43 28 9	5 12 12 8	5 55 12 9	6 2 8 10	6 42 8 11	8.6	S.	25	0 58 28 10	1 43 28 9	5 12 12 8	5 55 12 9	6 2 8 10	6 42 8 11	8.6		
M.	26	2 27 29 1	3 8 29 9	6 35 12 11	7 10 13 3	7 21 9 1	7 57 9 4	9.6	M.	26	2 27 29 1	3 8 29 9	6 35 12 11	7 10 13 3	7 21 9 1	7 57 9 4	9.6		
Tu.	27	3 46 30 7	4 20 31 6	7 40 13 7	8 7 13 11	8 30 9 6	8 59 9 8	10.6	Tu.	27	3 46 30 7	4 20 31 6	7 40 13 7	8 7 13 11	8 30 9 6	8 59 9 8	10.6		
W.	28	4 51 32 7	5 17 33 7	8 31 14 4	8 51 14 9	9 27 9 11	9 50 10 2	11.6	W.	28	4 51 32 7	5 17 33 7	8 31 14 4	8 51 14 9	9 27 9 11	9 50 10 2	11.6		
Th.	29	5 41 34 6	6 2 35 2	9 9 15 0	9 27 15 3	10 9 10 4	10 26 10 6	12.6	Th.	29	5 41 34 6	6 2 35 2	9 9 15 0	9 27 15 3	10 9 10 4	10 26 10 6	12.6		
F.	30	6 22 35 9	6 41 36 2	9 44 15 6	10 1 15 8	10 41 10 8	10 58 10 9	13.6	F.	30	6 22 35 9	6 41 36 2	9 44 15 6	10 1 15 8	10 41 10 8	10 58 10 9	13.6		
S.	31	6 59 36 6	7 16 36 9	10 17 15 9	10 32 15 10	11 14 10 10	11 30 10 11	0	S.	31	6 59 36 6	7 16 36 9	10 17 15 9	10 32 15 10	11 14 10 10	11 30 10 11	0		
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.									

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	12 35	Sub.	9	10 44	Sub.	17	8 32	Sub.	25	6 7	Sub.
2	12 22		10	10 29		18	8 14		26	5 48	
3	12 10		11	10 13		19	7 56		27	5 30	
4	11 56		12	9 57		20	7 38		28	5 11	
5	11 43		13	9 40		21	7 20		29	4 53	
6	11 29		14	9 23		22	7 2		30	4 34	
7	11 14		15	9 6		23	6 44		31	4 16	
8	10 59		16	8 49		24	6 25				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.														
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.											
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.										
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.											
Th.	1	morn.	10 46	9 5	11 4	9 6	8 1	7 7	8 18	7 9	5 14	11 1	5 33	11 3															
F.	2	0 32	11 20	9 6	11 36	9 6	8 34	7 9	8 49	7 10	5 50	11 4	6 6	11 4															
S.	3	1 16	11 51	9 5	—	—	9 3	7 9	9 18	7 7	6 21	11 3	6 37	11 2															
S.	4	2 0	0 7	9 5	0 24	9 4	9 34	7 6	8 48	7 4	6 54	11 0	7 10	10 9															
M.	5	2 43	0 41	9 4	0 57	9 3	10 3	7 2	10 17	7 0	7 26	10 6	7 41	10 3															
Tu.	6	3 27	1 14	9 2	1 32	9 1	10 33	6 10	10 50	6 7	7 58	9 11	8 14	9 7															
W.	7	4 12	1 51	8 11	2 11	8 9	11 9	6 4	11 33	6 1	8 32	9 4	8 51	9 0															
Th.	8	4 58	2 32	8 7	2 53	8 5	11 58	5 10	—	—	9 13	8 9	9 39	8 5															
F.	9	5 45	3 15	8 3	3 40	8 1	0 28	5 6	0 59	5 4	10 6	8 2	10 39	8 0															
S.	10	6 34	4 10	8 0	4 46	7 11	1 36	5 3	2 19	5 2	11 17	7 10	11 56	7 9															
S.	11	7 24	5 23	7 10	6 3	7 10	3 0	5 3	3 41	5 5	—	—	0 37	7 10															
M.	12	8 15	6 45	7 10	7 23	7 11	4 19	5 8	4 49	5 11	1 19	8 0	1 56	8 3															
Tu.	13	9 7	7 57	8 1	8 26	8 4	5 17	6 2	5 41	6 6	2 30	8 7	2 58	9 1															
W.	14	9 59	8 51	8 8	9 13	8 11	6 2	6 9	6 23	7 1	3 22	9 6	3 43	10 0															
Th.	15	10 52	9 34	9 2	9 55	9 5	6 45	7 4	7 7	7 8	4 2	10 6	4 21	11 0															
F.	16	11 45	10 14	9 7	10 34	9 9	7 27	7 11	7 49	8 1	4 40	11 4	5 1	11 9															
S.	17	0 39	10 54	9 10	11 14	9 11	8 9	8 3	8 27	8 5	5 23	12 0	5 44	12 2															
S.	18	1 34	11 34	9 11	11 55	9 11	8 47	8 6	9 7	8 5	6 4	12 3	6 25	12 3															
M.	19	2 31	—	—	0 17	9 11	9 27	8 4	9 47	8 2	6 47	12 1	7 9	11 10															
Tu.	20	3 28	0 40	9 10	1 3	9 9	10 8	7 11	10 30	7 8	7 31	11 6	7 54	11 1															
W.	21	4 26	1 28	9 7	1 53	9 5	10 53	7 5	11 19	7 1	8 17	10 8	8 40	10 3															
Th.	22	5 24	2 20	9 3	2 48	9 0	11 51	6 8	—	—	9 7	9 9	9 40	9 4															
F.	23	6 20	3 17	8 9	3 49	8 6	0 28	6 3	1 8	5 11	10 15	8 11	10 55	8 8															
S.	24	7 14	4 25	8 4	5 3	8 2	1 54	5 9	2 39	5 8	11 35	8 6	—	—															
S.	25	8 6	5 43	8 1	6 25	8 0	3 21	5 9	4 0	6 0	0 16	8 5	0 59	8 5															
M.	26	8 56	7 7	8 1	7 44	8 2	4 36	6 2	5 5	6 4	1 40	8 7	2 16	8 9															
Tu.	27	9 43	8 15	8 4	8 41	8 6	5 30	6 6	5 53	6 8	2 47	9 1	3 12	9 4															
W.	28	10 28	9 5	8 9	9 26	8 11	6 15	6 10	6 36	7 0	3 35	9 9	3 53	10 1															
Th.	29	11 12	9 45	9 1	10 3	9 3	6 56	7 2	7 15	7 4	4 11	10 4	4 29	10 7															
F.	30	11 56	10 19	9 4	10 37	9 4	7 33	7 5	7 51	7 6	4 46	10 10	5 4	11 0															
S.	31	morn.	10 53	9 5	11 9	9 5	8 7	7 7	8 22	7 8	5 22	11 1	5 38	11 2															
Half Mean Spring } Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.														
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D. ° ' "														
Full - - - - - 1 11 52 Morning.															1 5 N. 1 9 18 S. 4 17 2 N. 33 25 15 N. 25														
Last Quarter - 9 3 53 Afternoon.															2 1 9 10 18 19 18 7 4 26 12 47														
New - - - - - 16 9 37 Afternoon.															3 2 S. 43 11 17 42 19 11 9 27 9 35														
First Quarter - 23 1 2 Afternoon.															4 6 24 12 16 10 20 14 29 28 6 1														
Full - - - - - 31 4 31 Morning.															5 9 48 13 13 44 21 16 50 29 2 13														
In Apogee - - 6 3 0 Afternoon.															6 12 46 14 10 28 22 18 6 30 18. 37														
In Perigee - - 18 2 0 Afternoon.															7 15 12 15 6 31 23 18 13 31 5 20														
															8 17 0 16 2 5 24 17 17														

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

MARCH, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
Th.	1	4	34	14	6	4	51	14	8	4	57	11	7	5	16	11	9	5	20	12	3	5	39	12	4	○
F.	2	5	8	14	10	5	25	15	0	5	34	11	10	5	52	11	10	5	55	12	5	6	12	12	6	15.1
S.	3	5	41	14	11	5	58	14	10	6	8	11	10	6	25	11	9	6	29	12	6	6	46	12	6	16.1
S.	4	6	15	14	8	6	31	14	5	6	41	11	8	6	57	11	6	7	2	12	5	7	18	12	4	17.1
M.	5	6	46	14	2	7	2	13	10	7	12	11	4	7	28	11	2	7	33	12	2	7	48	12	0	18.1
Tu.	6	7	19	13	6	7	37	13	1	7	44	10	11	8	0	10	7	8	4	11	10	8	19	11	7	19.1
W.	7	7	56	12	8	8	15	12	2	8	16	10	4	8	32	10	1	8	34	11	4	8	50	11	1	20.1
Th.	8	8	35	11	8	8	57	11	2	8	49	9	9	9	9	9	5	9	6	10	9	9	23	10	6	21.1
F.	9	9	20	10	9	9	49	10	4	9	29	9	2	9	53	8	11	9	44	10	2	10	12	9	10	⊕
S.	10	10	25	10	1	11	4	10	0	10	25	8	8	11	3	8	7	10	47	9	7	11	23	9	5	23.1
S.	11	11	48	10	1	—	—	—	—	11	45	8	7	—	—	—	—	—	—	—	—	0	3	9	4	24.1
M.	12	0	31	10	4	1	8	10	9	0	29	8	9	1	8	9	0	0	43	9	5	1	19	9	8	25.1
Tu.	13	1	41	11	3	2	9	11	11	1	46	9	3	2	20	9	8	1	55	10	0	2	30	10	5	26.1
W.	14	2	34	12	6	2	58	13	3	2	50	10	1	3	16	10	7	3	2	10	11	3	31	11	5	27.1
Th.	15	3	21	13	10	3	41	14	5	3	39	11	1	4	2	11	6	3	57	11	10	4	21	12	3	28.1
F.	16	4	0	14	11	4	21	15	5	4	23	11	10	4	44	12	2	4	44	12	7	5	7	12	11	●
S.	17	4	41	15	10	5	1	16	2	5	6	12	6	5	28	12	8	5	29	13	1	5	49	13	3	0.6
S.	18	5	23	16	5	5	45	16	5	5	50	12	9	6	12	12	10	6	10	13	5	6	32	13	6	1.6
M.	19	6	7	16	3	6	30	16	0	6	34	12	9	6	56	12	7	6	55	13	5	7	17	13	4	2.6
Tu.	20	6	52	15	8	7	15	15	3	7	18	12	4	7	40	12	0	7	39	13	2	8	1	12	11	3.6
W.	21	7	39	14	8	8	4	14	1	8	2	11	8	8	24	11	3	8	22	12	8	8	42	12	3	4.6
Th.	22	8	30	13	4	8	59	12	7	8	45	10	10	9	10	10	5	9	3	11	10	9	25	11	5	5.6
F.	23	9	28	11	11	10	4	11	4	9	36	9	11	10	7	9	7	9	52	10	11	10	27	10	6	⊕
S.	24	10	43	11	0	11	27	10	11	10	42	9	4	11	24	9	2	11	4	10	2	11	43	9	11	7.6
S.	25	—	—	—	—	0	11	11	0	—	—	—	—	0	9	9	1	—	—	—	—	0	23	9	10	8.6
M.	26	0	52	11	2	1	28	11	6	0	52	9	3	1	32	9	6	1	3	10	0	1	41	10	2	9.6
Tu.	27	1	58	11	11	2	24	12	4	2	8	9	9	2	39	10	0	2	17	10	6	2	50	10	9	10.6
W.	28	2	49	12	9	3	12	13	2	3	6	10	4	3	30	10	7	3	21	11	1	3	46	11	5	11.6
Th.	29	3	31	13	6	3	49	13	10	3	51	10	11	4	11	11	1	4	10	11	8	4	31	11	10	12.6
F.	30	4	6	14	1	4	24	14	4	4	29	11	3	4	47	11	5	4	51	12	0	5	10	12	2	13.6
S.	31	4	40	14	6	4	56	14	8	5	5	11	7	5	22	11	8	5	28	12	2	5	43	12	3	○
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	35		9	10	44		17	8	32		25	6	7	
2	12	22		10	10	29		18	8	14		26	5	48	
3	12	10		11	10	13		19	7	56		27	5	30	
4	11	56		12	9	57		20	7	38		28	5	11	
5	11	43		13	9	40		21	7	20		29	4	53	
6	11	29		14	9	23		22	7	2		30	4	34	
7	11	14		15	9	6		23	6	44		31	4	16	
8	10	59		16	8	49		24	6	25					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.
S.	1	om 39	4	23	18	10	4	40	18	9	6	20	15	5	6	36	15	2	0	2	12	7	0	19	12	7
M.	2	1 23	4	54	18	8	5	9	18	5	6	51	15	2	7	5	14	11	0	36	12	6	0	53	12	5
Tu.	3	2 8	5	24	18	1	5	39	17	10	7	18	14	9	7	32	14	6	1	9	12	3	1	24	12	1
W.	4	2 53	5	55	17	5	6	11	17	1	7	47	14	3	8	2	14	0	1	40	12	0	1	56	11	10
Th.	5	3 40	6	28	16	7	6	45	16	0	8	17	13	7	8	31	13	6	2	12	11	8	2	29	11	5
F.	6	4 27	7	6	15	5	7	28	14	10	8	47	12	11	9	6	12	11	2	47	11	3	3	6	11	0
S.	7	5 16	7	50	14	3	8	16	13	8	9	27	12	3	9	49	12	5	3	27	10	9	3	49	10	6
S.	8	6 5	8	47	13	3	9	21	13	1	10	14	11	9	10	46	12	0	4	13	10	2	4	43	9	11
M.	9	6 55	10	1	13	2	10	44	13	4	11	19	11	5	—	—	—	—	5	15	9	9	5	53	9	9
Tu.	10	7 46	11	24	13	9	—	—	—	—	0	2	12	1	0	46	11	9	6	33	9	9	7	12	10	0
W.	11	8 37	0	3	14	4	0	36	15	2	1	28	12	9	2	7	12	7	7	50	10	5	8	26	10	10
Th.	12	9 29	1	6	16	0	1	34	16	11	2	42	13	8	3	14	13	8	8	57	11	4	9	26	11	9
F.	13	10 22	1	58	17	10	2	20	18	8	3	42	14	10	4	10	14	10	9	52	12	2	10	15	12	7
S.	14	11 17	2	41	19	6	3	3	20	3	4	35	15	8	5	0	15	8	10	37	12	11	10	59	13	3
S.	15	0 14	3	25	20	8	3	48	21	0	5	23	16	4	5	46	16	4	11	21	13	5	11	44	13	7
M.	16	1 12	4	11	21	1	4	34	21	2	6	10	16	8	6	33	16	7	—	—	—	—	0	7	13	8
Tu.	17	2 12	4	56	21	0	5	19	20	8	6	55	16	7	7	16	16	5	0	31	13	8	0	55	13	7
W.	18	3 12	5	41	20	2	6	4	19	8	7	38	16	3	8	1	16	0	1	19	13	5	1	42	13	2
Th.	19	4 11	6	27	18	11	6	52	18	0	8	24	15	6	8	46	15	4	2	5	12	11	2	28	12	8
F.	20	5 8	7	19	17	2	7	47	16	2	9	8	14	7	9	33	14	5	2	53	12	3	3	19	11	10
S.	21	6 2	8	16	15	5	8	47	14	9	9	58	13	6	10	25	13	6	3	45	11	5	4	13	11	1
S.	22	6 53	9	20	14	3	10	1	14	0	10	56	12	6	11	28	12	10	4	43	10	8	5	15	10	4
M.	23	7 41	10	43	13	11	11	22	14	1	—	—	—	—	0	8	12	1	5	53	10	2	6	32	10	1
Tu.	24	8 27	11	59	14	4	—	—	—	—	0	50	12	9	1	29	12	4	7	9	10	2	7	46	10	5
W.	25	9 11	0	33	14	9	1	2	15	2	2	4	13	1	2	37	12	11	8	22	10	8	8	53	10	11
Th.	26	9 55	1	29	15	9	1	51	16	3	3	6	12	9	3	32	13	8	9	21	11	2	9	45	11	5
F.	27	10 38	2	12	16	9	2	30	17	2	3	56	14	4	4	20	14	3	10	7	11	8	10	26	11	10
S.	28	11 21	2	48	17	7	3	5	17	11	4	41	14	9	5	0	14	8	10	44	12	0	11	1	12	1
S.	29	morn.	3	22	18	2	3	38	18	2	5	18	15	0	5	34	15	0	11	18	12	2	11	34	12	3
M.	30	0 5	3	55	18	3	4	12	18	2	5	50	15	0	6	6	15	0	11	51	12	3	—	—	—	—
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4 in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
Last Quarter - 8 8 42 Morning.												1 8 8.49 9 14 8.43 17 16 N. 5 25 3 N. 9														
New - - - - - 15 7 3 Morning.												2 11 55 10 11 51 18 17 49 26 0 8.40														
First Quarter 21 10 31 Afternoon.												3 14 31 11 8 15 19 18 19 27 4 24														
Full - - - - - 29 9 23 Afternoon.												4 16 30 12 4 5 20 17 40 28 7 57														
												5 17 47 13 0 N. 27 21 15 59 29 11 10														
In Apogee - - 3 5 0 Morning.												6 18 18 14 5 5 22 13 30 30 13 55														
In Perigee - - 15 10 0 Afternoon.												7 17 58 15 9 27 23 10 24														
In Apogee - - 30 10 0 Morning.												8 16 47 16 13 13 24 6 54														

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.		D.
S.	1	11 53	18 6	—	—	1 22	16 0	1 38	16 1	2 53	18 11	3 8	19 0	15.6
M.	2	0 10	18 5	0 27	18 4	1 54	16 0	2 10	15 11	3 24	19 0	3 40	19 0	16.6
Tu.	3	0 44	18 2	1 1	18 0	2 25	15 10	2 40	15 8	3 55	18 11	4 10	18 10	17.6
W.	4	1 18	17 9	1 35	17 6	2 54	15 6	3 9	15 4	4 26	18 8	4 42	18 6	18.6
Th.	5	1 52	17 3	2 9	16 11	3 25	15 1	3 41	14 10	4 57	18 3	5 12	18 0	19.6
F.	6	2 28	16 6	2 48	16 1	3 58	14 7	4 16	14 3	5 30	17 8	5 47	17 4	20.6
S.	7	3 8	15 7	3 30	15 2	4 36	13 11	4 58	13 7	6 7	17 0	6 28	16 9	21.6
S.	8	3 54	14 9	4 21	14 4	5 22	13 3	5 50	13 0	6 51	16 4	7 18	16 0	(
M.	9	4 52	14 0	5 26	13 11	6 24	12 9	7 1	12 7	7 49	15 9	8 29	15 7	23.6
Tu.	10	6 1	14 0	6 38	14 5	7 42	12 9	8 25	12 11	9 11	15 7	9 51	15 7	24.6
W.	11	7 16	15 0	7 51	15 9	9 3	13 3	9 40	13 8	10 30	15 10	11 9	16 2	25.6
Th.	12	8 22	16 5	8 49	17 1	10 13	14 2	10 41	14 8	11 41	16 8	—	—	26.6
F.	13	9 15	17 9	9 39	18 5	11 8	15 2	11 31	15 7	0 10	17 2	0 37	17 8	27.6
S.	14	10 3	19 0	10 27	19 6	11 52	16 1	—	—	1 1	18 3	1 25	18 9	28.6
S.	15	10 50	19 11	11 15	20 2	0 14	16 6	0 36	16 10	1 44	19 3	2 6	19 8	●
M.	16	11 40	20 4	—	—	0 58	17 1	1 20	17 3	2 29	20 0	2 50	20 3	1.2
Tu.	17	0 5	20 4	0 30	20 3	1 43	17 3	2 5	17 3	3 13	20 5	3 35	20 6	2.2
W.	18	0 55	20 1	1 21	19 9	2 27	17 2	2 49	16 11	3 56	20 5	4 19	20 3	3.2
Th.	19	1 45	19 4	2 9	18 10	3 11	16 8	3 34	16 4	4 43	19 11	5 7	19 7	4.2
F.	20	2 35	18 2	3 0	17 6	3 58	15 11	4 23	15 5	5 30	19 2	5 55	18 8	5.2
S.	21	3 26	16 9	3 54	16 2	4 49	14 10	5 17	14 4	6 20	18 1	6 48	17 6	D
S.	22	4 22	15 6	4 51	15 0	5 49	14 0	6 23	13 7	7 17	17 1	7 51	16 8	7.2
M.	23	5 26	14 8	6 1	14 6	6 59	13 3	7 42	13 2	8 29	16 3	9 9	16 1	8.2
Tu.	24	6 36	14 8	7 12	15 0	8 24	13 3	9 0	13 5	9 49	15 11	10 27	16 1	9.2
W.	25	7 48	15 5	8 18	15 9	9 37	13 8	10 10	13 11	11 4	16 2	11 37	16 5	10.2
Th.	26	8 44	16 2	9 8	16 6	10 38	14 3	11 3	14 6	—	—	0 7	16 8	11.2
F.	27	9 30	16 11	9 50	17 2	11 25	14 9	11 45	15 0	0 33	16 11	0 53	17 3	12.2
S.	28	10 10	17 5	10 29	17 8	—	—	0 3	15 3	1 13	17 7	1 33	17 10	13.2
S.	29	10 47	17 10	11 5	17 11	0 21	15 5	0 38	15 6	1 51	18 1	2 8	18 3	○
M.	30	11 23	17 11	11 41	17 11	0 55	15 7	1 11	15 8	2 24	18 5	2 42	18 6	15.2

Half Mean Spring } 9^{ft.} 4^{in.}
Range. }

8^{ft.} 0^{in.}

9ⁿ. 7ⁱⁿ.

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	58	Sub.	9	1	37	Sub.	17	0	27	Add.	25	2	7	Add.
2	3	39		10	1	20		18	0	41		26	2	17	
3	3	21		11	1	4		19	0	54		27	2	27	
4	3	3		12	0	48		20	1	7		28	2	37	
5	2	46		13	0	32		21	1	20		29	2	46	
6	2	28		14	0	17		22	1	32		30	2	54	
7	2	11		15	0	2		23	1	44					
8	1	54		16	0	13		24	1	56					
							Add.								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	om39	4 23	18	10	4 40	18	9	6 20	15	5	6 36	15	2	0 2	12	7	0 19	12	7	0 19	12	7	0 19	12	7
M.	2	1 23	4 54	18	8	5 9	18	5	6 51	15	2	7 5	14	11	0 36	12	6	0 53	12	5	0 53	12	5	0 53	12	5
Tu.	3	2 8	5 24	18	1	5 39	17	10	7 18	14	9	7 32	14	6	1 9	12	3	1 24	12	1	1 24	12	1	1 24	12	1
W.	4	2 53	5 55	17	5	6 11	17	1	7 47	14	3	8 2	14	0	1 40	12	0	1 56	11	10	1 56	11	10	1 56	11	10
Th.	5	3 40	6 28	16	7	6 45	16	0	8 17	13	7	8 31	13	6	2 12	11	8	2 29	11	5	2 29	11	5	2 29	11	5
F.	6	4 27	7 6	15	5	7 28	14	10	8 47	12	11	9 6	12	11	2 47	11	3	3 6	11	0	3 6	11	0	3 6	11	0
S.	7	5 16	7 50	14	3	8 16	13	8	9 27	12	3	9 49	12	5	3 27	10	9	3 49	10	6	3 49	10	6	3 49	10	6
S.	8	6 5	8 47	13	3	9 21	13	1	10 14	11	9	10 46	12	0	4 13	10	2	4 43	9	11	4 43	9	11	4 43	9	11
M.	9	6 55	10 1	13	2	10 44	13	4	11 19	11	5	—	—	—	5 15	9	9	5 53	9	9	5 53	9	9	5 53	9	9
Tu.	10	7 46	11 24	13	9	—	—	—	0 2	12	1	0 46	11	9	6 33	9	9	7 12	10	0	7 12	10	0	7 12	10	0
W.	11	8 37	0 3	14	4	0 36	15	2	1 28	12	9	2 7	12	7	7 50	10	5	8 26	10	10	8 26	10	10	8 26	10	10
Th.	12	9 29	1 6	16	0	1 34	16	11	2 42	13	8	3 14	13	8	8 57	11	4	9 26	11	9	9 26	11	9	9 26	11	9
F.	13	10 22	1 58	17	10	2 20	18	8	3 42	14	10	4 10	14	10	9 52	12	2	10 15	12	7	10 15	12	7	10 15	12	7
S.	14	11 17	2 41	19	6	3 32	20	3	4 35	15	8	5 0	15	8	10 37	12	11	10 59	13	3	10 59	13	3	10 59	13	3
S.	15	om14	3 25	20	8	3 48	21	0	5 23	16	4	5 46	16	4	11 21	13	5	11 44	13	7	11 44	13	7	11 44	13	7
M.	16	1 12	4 11	21	1	4 34	21	2	6 10	16	8	6 33	16	7	—	—	—	0 7	13	8	0 7	13	8	0 7	13	8
Tu.	17	2 12	4 56	21	0	5 19	20	8	6 55	16	7	7 16	16	5	0 31	13	8	0 55	13	7	0 55	13	7	0 55	13	7
W.	18	3 12	5 41	20	2	6 4	19	8	7 38	16	3	8 1	16	0	1 19	13	5	1 42	13	2	1 42	13	2	1 42	13	2
Th.	19	4 11	6 27	18	11	6 52	18	0	8 24	15	6	8 46	15	4	2 5	12	11	2 28	12	8	2 28	12	8	2 28	12	8
F.	20	5 8	7 19	17	2	7 47	16	2	9 8	14	7	9 33	14	5	2 53	12	3	3 19	11	10	3 19	11	10	3 19	11	10
S.	21	6 2	8 16	15	5	8 47	14	9	9 58	13	6	10 25	13	6	3 45	11	5	4 13	11	1	4 13	11	1	4 13	11	1
S.	22	6 53	9 20	14	3	10 1	14	0	10 56	12	6	11 28	12	10	4 43	10	8	5 15	10	4	5 15	10	4	5 15	10	4
M.	23	7 41	10 43	13	11	11 22	14	1	—	—	—	0 8	12	1	5 53	10	2	6 32	10	1	6 32	10	1	6 32	10	1
Tu.	24	8 27	11 59	14	4	—	—	—	0 50	12	9	1 29	12	4	7 9	10	2	7 46	10	5	7 46	10	5	7 46	10	5
W.	25	9 11	0 33	14	9	1 2	15	2	2 4	13	1	2 37	12	11	8 22	10	8	8 53	10	11	8 53	10	11	8 53	10	11
Th.	26	9 55	1 29	15	9	1 51	16	3	3 6	12	9	3 32	13	8	9 21	11	2	9 45	11	5	9 45	11	5	9 45	11	5
F.	27	10 38	2 12	16	9	2 30	17	2	3 56	14	4	4 20	14	3	10 7	11	8	10 26	11	10	10 26	11	10	10 26	11	10
S.	28	11 21	2 48	17	7	3 5	17	11	4 41	14	9	5 0	14	8	10 44	12	0	11 1	12	1	11 1	12	1	11 1	12	1
S.	29	morn.	3 22	18	2	3 38	18	2	5 18	15	0	5 34	15	0	11 18	12	2	11 34	12	3	11 34	12	3	11 34	12	3
M.	30	0 5	3 55	18	3	4 12	18	2	5 50	15	0	6 6	15	0	11 51	12	3	—	—	—	—	—	—	—	—	—
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4 in.							
Phases of the Moon.											Moon's Declination at Noon.															
D. H. M.											M.D. ° ' "				M.D. ° ' "				M.D. ° ' "				M.D. ° ' "			
Last Quarter - 8 8 42 Morning.											1 8 8.49				9 14 8.43				17 16 N. 5				25 3 N. 9			
New - - - - - 15 7 3 Morning.											2 11 55				10 11 51				18 17 49				26 0 8.40			
First Quarter 21 10 31 Afternoon.											3 14 31				11 8 15				19 18 19				27 4 24			
Full - - - - - 29 9 23 Afternoon.											4 16 30				12 4 5				20 17 40				28 7 57			
											5 17 47				13 0 N.27				21 15 59				29 11 10			
In Apogee - - 3 5 0 Morning.											6 18 18				14 5 5				22 13 30				30 13 55			
In Perigee - - 15 10 0 Afternoon.											7 17 58				15 9 27				23 10 24							
In Apogee - - 30 10 0 Morning.											8 16 47				16 13 13				24 6 54							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.		D.
S.	1	11 53	18 6	—	—	1 22	16 0	1 38	16 1	2 53	18 11	3 8	19 0	15.6
M.	2	0 10	18 5	0 27	18 4	1 54	16 0	2 10	15 11	3 24	19 0	3 40	19 0	16.6
Tu.	3	0 44	18 2	1 1	18 0	2 25	15 10	2 40	15 8	3 55	18 11	4 10	18 10	17.6
W.	4	1 18	17 9	1 35	17 6	2 54	15 6	3 9	15 4	4 26	18 8	4 42	18 6	18.6
Th.	5	1 52	17 3	2 9	16 11	3 25	15 1	3 41	14 10	4 57	18 3	5 12	18 0	19.6
F.	6	2 28	16 6	2 48	16 1	3 58	14 7	4 16	14 3	5 30	17 8	5 47	17 4	20.6
S.	7	3 8	15 7	3 30	15 2	4 36	13 11	4 58	13 7	6 7	17 0	6 28	16 9	21.6
S.	8	3 54	14 9	4 21	14 4	5 22	13 3	5 50	13 0	6 51	16 4	7 18	16 0	22.6
M.	9	4 52	14 0	5 26	13 11	6 24	12 9	7 1	12 7	7 49	15 9	8 29	15 7	23.6
Tu.	10	6 1	14 0	6 38	14 5	7 42	12 9	8 25	12 11	9 11	15 7	9 51	15 7	24.6
W.	11	7 16	15 0	7 51	15 9	9 3	13 3	9 40	13 8	10 30	15 10	11 9	16 2	25.6
Th.	12	8 22	16 5	8 49	17 11	10 13	14 2	10 41	14 8	11 41	16 8	—	—	26.6
F.	13	9 15	17 9	9 39	18 5	11 8	15 2	11 31	15 7	0 10	17 2	0 37	17 8	27.6
S.	14	10 3	19 0	10 27	19 6	11 52	16 1	—	—	1 1	18 3	1 25	18 9	28.6
S.	15	10 50	19 11	11 15	20 2	0 14	16 6	0 36	16 10	1 44	19 3	2 6	19 8	29.6
M.	16	11 40	20 4	—	—	0 58	17 1	1 20	17 3	2 29	20 0	2 50	20 3	30.6
Tu.	17	0 5	20 4	0 30	20 3	1 43	17 3	2 5	17 3	3 13	20 5	3 35	20 6	31.6
W.	18	0 55	20 1	1 21	19 9	2 27	17 2	2 49	16 11	3 56	20 5	4 19	20 3	32.6
Th.	19	1 45	19 4	2 9	18 10	3 11	16 8	3 34	16 4	4 43	19 11	5 7	19 7	33.6
F.	20	2 35	18 2	3 0	17 6	3 58	15 11	4 23	15 5	5 30	19 2	5 55	18 8	34.6
S.	21	3 26	16 9	3 54	16 2	4 49	14 10	5 17	14 4	6 20	18 1	6 48	17 6	35.6
S.	22	4 22	15 6	4 51	15 0	5 49	14 0	6 23	13 7	7 17	17 1	7 51	16 8	36.6
M.	23	5 26	14 8	6 1	14 6	6 59	13 3	7 42	13 2	8 29	16 3	9 9	16 1	37.6
Tu.	24	6 36	14 8	7 12	15 0	8 24	13 3	9 0	13 5	9 49	15 11	10 27	16 1	38.6
W.	25	7 48	15 5	8 18	15 9	9 37	13 8	10 10	13 11	11 4	16 2	11 37	16 5	39.6
Th.	26	8 44	16 2	9 8	16 6	10 38	14 3	11 3	14 6	—	—	0 7	16 8	40.6
F.	27	9 30	16 11	9 50	17 2	11 25	14 9	11 45	15 0	0 33	16 11	0 53	17 3	41.6
S.	28	10 10	17 5	10 29	17 8	—	—	0 3	15 3	1 13	17 7	1 33	17 10	42.6
S.	29	10 47	17 10	11 5	17 11	0 21	15 5	0 38	15 6	1 51	18 1	2 8	18 3	43.6
M.	30	11 23	17 11	11 41	17 11	0 55	15 7	1 11	15 8	2 24	18 5	2 42	18 6	44.6

Half Mean Spring } 9^{ft.} 4^{in.}
Range.

8^{ft.} 0^{in.}

9^{ft.} 7^{in.}

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	58	Sub.	9	1	37	Sub.	17	0	27	Add.	25	2	7	Add.
2	3	39		10	1	20		18	0	41		26	2	17	
3	3	21		11	1	4		19	0	54		27	2	27	
4	3	3		12	0	48		20	1	7		28	2	37	
5	2	46		13	0	32		21	1	20		29	2	46	
6	2	28		14	0	17		22	1	32		30	2	54	
7	2	11		15	0	2		23	1	44					
8	1	54		16	0	13		24	1	56					
							Add.								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

APRIL, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.							
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.		
♄.	1	om39	0	35	11	7	0	51	11	7	7	10	20	8	7	27	20	8	4	1	14	3	4	17	14	3	4	17	14	3	
M.	2	1 23	1	8	11	6	1	25	11	5	7	44	20	7	7	59	20	6	4	34	14	3	4	48	14	2	4	48	14	2	
Tu.	3	2 8	1	40	11	4	1	55	11	2	8	13	20	3	8	28	20	1	5	3	13	11	5	18	13	8	5	18	13	8	
W.	4	2 53	2	10	11	1	2	26	10	11	8	44	19	9	9	0	19	4	5	34	13	5	5	51	13	2	5	51	13	2	
Th.	5	3 40	2	43	10	9	2	59	10	7	9	17	18	11	9	34	18	6	6	8	12	10	6	26	12	6	6	26	12	6	
F.	6	4 27	3	16	10	5	3	33	10	3	9	52	18	1	10	12	17	7	6	46	12	3	7	8	11	11	7	8	11	11	
S.	7	5 16	3	52	10	1	4	13	9	11	10	34	17	2	11	1	16	8	7	30	11	7	7	54	11	3	7	54	11	3	
♄.	8	6 5	4	35	9	9	5	2	9	7	11	32	16	3	—	—	—	—	8	22	10	11	8	55	10	9	8	55	10	9	
M.	9	6 55	5	33	9	5	6	7	9	5	0	8	15	11	0	45	15	8	9	32	10	7	10	12	10	7	10	12	10	7	
Tu.	10	7 46	6	49	9	6	7	33	9	7	1	22	15	9	2	0	15	11	10	52	10	9	11	28	11	0	11	28	11	0	
W.	11	8 37	8	11	9	10	8	47	10	1	2	35	16	5	3	9	17	2	—	—	—	—	0	1	11	6	0	0	1	11	6
Th.	12	9 29	9	20	10	5	9	49	10	9	3	41	18	0	4	10	18	9	0	32	12	1	1	0	12	7	1	0	1	12	7
F.	13	10 22	10	17	11	1	10	42	11	4	4	37	19	6	5	0	20	3	1	27	13	2	1	53	13	8	1	53	13	8	
S.	14	11 17	11	4	11	8	11	26	11	11	5	21	20	10	5	43	21	5	2	16	14	2	2	39	14	7	2	39	14	7	
♄.	15	om14	11	49	12	2	—	—	—	—	6	5	21	11	6	28	22	3	3	0	15	0	3	20	15	3	3	20	15	3	
M.	16	1 12	0	11	12	3	0	33	12	4	6	51	22	6	7	14	22	8	3	43	15	6	4	6	15	8	4	6	15	8	
Tu.	17	2 12	0	56	12	4	1	19	12	4	7	37	22	8	8	0	22	7	4	28	15	9	4	50	15	7	4	50	15	7	
W.	18	3 12	1	42	12	2	2	5	12	0	8	23	22	3	8	46	21	10	5	13	15	4	5	37	14	11	5	37	14	11	
Th.	19	4 11	2	29	11	10	2	52	11	7	9	10	21	3	9	33	20	7	6	1	14	6	6	26	14	0	6	26	14	0	
F.	20	5 8	3	16	11	4	3	40	11	0	9	58	19	10	10	25	19	1	6	53	13	6	7	21	13	0	7	21	13	0	
S.	21	6 2	4	5	10	9	4	31	10	5	10	55	18	4	11	30	17	9	7	50	12	5	8	21	12	0	8	21	12	0	
♄.	22	6 53	5	2	10	2	5	33	10	0	—	—	—	—	0	7	17	2	8	55	11	7	9	31	11	4	9	31	11	4	
M.	23	7 41	6	6	9	10	6	49	9	9	0	44	16	8	1	22	16	6	10	12	11	2	10	51	11	1	10	51	11	1	
Tu.	24	8 27	7	32	9	10	8	9	9	11	1	59	16	6	2	32	16	9	11	25	11	3	11	58	11	6	11	58	11	6	
W.	25	9 11	8	44	10	1	9	17	10	3	3	6	17	2	3	38	17	8	—	—	—	—	0	29	11	10	0	0	29	11	10
Th.	26	9 55	9	45	10	5	10	12	10	8	4	7	18	1	4	32	18	6	0	57	12	1	1	22	12	5	1	22	12	5	
F.	27	10 38	10	36	10	10	10	56	11	0	4	54	18	11	5	13	19	3	1	46	12	9	2	8	13	0	2	8	13	0	
S.	28	11 21	11	15	11	1	11	33	11	3	5	31	19	6	5	49	19	9	2	27	13	2	2	46	13	5	2	46	13	5	
♄.	29	morn.	11	51	11	4	—	—	—	—	6	7	19	11	6	25	20	0	3	3	13	7	3	18	13	8	3	18	13	8	
M.	30	0 5	0	8	11	4	0	24	11	4	6	42	20	1	6	58	20	1	3	34	13	9	3	50	13	10	3	50	13	10	

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter	8	8	42	Morning.	1	8	8.49	9	14	8.43	17	16	N. 5	25	3	N. 9
New - - - -	15	7	3	Morning.	2	11	55	10	11	51	18	17	49	26	0	8.40
First Quarter	21	10	31	Afternoon.	3	14	31	11	8	15	19	18	19	27	4	24
Full - - - -	29	9	23	Afternoon.	4	16	30	12	4	5	20	17	40	28	7	57
					5	17	47	13	0	N.27	21	15	59	29	11	10
In Apogee -	3	5	0	Morning.	6	18	18	14	5	5	22	13	30	30	13	55
In Perigee -	15	10	0	Afternoon.	7	17	58	15	9	27	23	10	24			
In Apogee -	30	10	0	Morning.	8	16	47	16	13	13	24	6	54			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
S.	1	4 2	13 1	4 18	13 1	2 59	16 3	3 14	16 2	9 2	13 1	9 19	13 0	15.6
M.	2	4 35	13 0	4 50	12 10	3 30	16 1	3 46	15 11	9 35	12 8	9 51	12 8	16.6
Tu.	3	5 6	12 8	5 22	12 5	4 1	15 8	4 17	15 5	10 7	12 5	10 23	12 2	17.6
W.	4	5 38	12 3	5 55	12 0	4 33	15 2	4 49	14 11	10 40	11 10	10 57	11 6	18.6
Th.	5	6 12	11 9	6 29	11 6	5 6	14 8	5 24	14 4	11 16	11 2	11 36	10 10	19.6
F.	6	6 48	11 2	7 9	10 10	5 44	14 0	6 6	13 7	11 57	10 5	—	—	20.6
S.	7	7 33	10 6	7 58	10 1	6 29	13 2	6 53	12 10	0 20	10 0	0 45	9 8	21.6
S.	8	8 29	9 9	9 5	9 6	7 24	12 6	7 59	12 3	1 14	9 5	1 50	9 2	22.6
M.	9	9 44	9 5	10 24	9 6	8 36	12 1	9 18	12 2	2 28	9 0	3 11	9 1	23.6
Tu.	10	11 4	9 9	11 41	10 1	9 59	12 4	10 34	12 8	3 57	9 2	4 34	9 5	24.6
W.	11	—	—	0 15	10 6	11 8	13 1	11 39	13 7	5 10	9 9	5 41	10 3	25.6
Th.	12	0 45	11 0	1 12	11 5	—	—	0 6	14 2	6 8	10 10	6 31	11 7	26.6
F.	13	1 36	11 11	1 59	12 5	0 30	14 9	0 53	15 5	6 52	12 3	7 11	12 11	27.6
S.	14	2 20	13 0	2 40	13 6	1 15	16 0	1 36	16 7	7 28	13 6	7 48	14 1	28.6
S.	15	3 1	13 10	3 22	14 2	1 58	17 1	2 20	17 5	8 9	14 5	8 30	14 8	29.6
M.	16	3 44	14 5	4 6	14 6	2 42	17 8	3 3	17 9	8 51	14 8	9 13	14 8	30.6
Tu.	17	4 29	14 6	4 53	14 4	3 24	17 8	3 47	17 6	9 36	14 6	10 1	14 2	31.6
W.	18	5 17	14 1	5 41	13 9	4 11	17 2	4 35	16 10	10 26	13 10	10 51	13 4	32.6
Th.	19	6 5	13 4	6 29	12 11	4 59	16 5	5 24	16 0	11 16	12 9	11 43	12 2	33.6
F.	20	6 55	12 5	7 22	11 11	5 51	15 5	6 19	14 9	—	—	0 11	11 7	34.6
S.	21	7 53	11 4	8 27	10 9	6 48	14 2	7 22	13 8	0 40	11 0	1 13	10 7	35.6
S.	22	9 4	10 5	9 48	10 2	7 58	13 2	8 35	12 11	1 49	10 2	2 27	9 10	36.6
M.	23	10 24	10 1	11 3	10 1	9 18	12 8	9 58	12 9	3 11	9 8	3 56	9 7	37.6
T.	24	11 38	10 3	—	—	10 32	12 10	11 5	13 1	4 31	9 7	5 7	9 9	38.6
W.	25	0 12	10 6	0 42	10 9	11 36	13 4	—	—	5 38	10 0	6 5	10 4	39.6
Th.	26	1 9	10 11	1 32	11 3	0 3	13 7	0 26	13 11	6 27	10 9	6 47	11 2	40.6
F.	27	1 53	11 6	2 12	11 9	0 47	14 4	1 7	14 8	7 4	11 6	7 20	11 11	41.6
S.	28	2 30	12 0	2 47	12 3	1 26	15 0	1 44	15 4	7 35	12 3	7 50	12 6	42.6
S.	29	3 3	12 5	3 19	12 7	2 1	15 6	2 17	15 8	8 5	12 8	8 21	12 9	43.6
M.	30	3 35	12 8	3 51	12 8	2 33	15 9	2 48	15 9	8 36	12 9	8 52	12 8	44.6
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	58	Sub.	9	1	37	Sub.	17	0	27	Add.	25	2	7	Add.
2	3	39		10	1	20		18	0	41		26	2	17	
3	3	21		11	1	4		19	0	54		27	2	27	
4	3	3		12	0	48		20	1	7		28	2	37	
5	2	46		13	0	32		21	1	20		29	2	46	
6	2	28		14	0	17		22	1	32		30	2	54	
7	2	11		15	0	2		23	1	44					
8	1	54		16	0	13		24	1	56					
							Add.								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	om 39	0 30	9 8	0 47	9 8	11 58	25 9	—	—	6 49	20 10	7 6	20 9
M.	2	1 23	1 4	9 8	1 20	9 7	0 15	25 8	0 30	25 6	7 21	20 7	7 36	20 4
Tu.	3	2 8	1 35	9 6	1 50	9 6	0 46	25 3	1 1	24 11	7 50	20 0	8 6	19 9
W.	4	2 53	2 6	9 5	2 21	9 4	1 16	24 7	1 32	24 1	8 23	19 4	8 39	18 11
Th.	5	3 40	2 37	9 3	2 53	9 1	1 48	23 6	2 4	23 0	8 56	18 6	9 13	18 0
F.	6	4 27	3 10	8 11	3 29	8 10	2 21	22 5	2 40	21 10	9 31	17 5	9 50	16 11
S.	7	5 16	3 50	8 8	4 12	8 6	3 1	21 3	3 23	20 8	10 10	16 5	10 32	15 10
S.	8	6 5	4 37	8 5	5 8	8 3	3 50	20 1	4 23	19 7	10 58	15 3	11 28	14 11
M.	9	6 55	5 41	8 2	6 19	8 1	5 0	19 3	5 42	19 4	—	—	0 2	14 11
Tu.	10	7 46	6 59	8 0	7 37	8 2	6 27	19 8	7 7	20 3	0 40	15 1	1 22	15 5
W.	11	8 37	8 14	8 5	8 48	8 8	7 43	21 0	8 17	22 0	2 4	16 1	2 41	16 11
Th.	12	9 29	9 19	8 11	9 47	9 2	8 44	22 11	9 10	23 11	3 14	17 10	3 44	18 10
F.	13	10 22	10 13	9 5	10 36	9 7	9 33	24 10	9 54	25 9	4 12	19 8	4 38	20 6
S.	14	11 17	11 0	9 9	11 24	9 11	10 14	26 6	10 37	27 1	5 3	21 4	5 28	21 11
S.	15	om 14	11 48	10 2	—	—	11 0	27 8	11 23	28 1	5 52	22 5	6 15	22 10
M.	16	1 12	0 12	10 3	0 35	10 4	11 46	28 3	—	—	6 37	23 0	7 0	23 1
Tu.	17	2 12	0 58	10 4	1 22	10 4	0 9	28 4	0 32	28 2	7 22	22 11	7 45	22 7
W.	18	3 12	1 45	10 3	2 8	10 2	0 56	27 10	1 19	27 3	8 9	22 1	8 32	21 6
Th.	19	4 11	2 30	10 0	2 53	9 10	1 40	26 6	2 3	25 8	8 55	20 10	9 18	20 0
F.	20	5 8	3 17	9 7	3 42	9 4	2 27	24 9	2 52	23 10	9 42	19 2	10 7	18 4
S.	21	6 2	4 9	9 2	4 38	8 11	3 20	22 10	3 49	22 0	10 33	17 7	10 59	16 9
S.	22	6 53	5 8	8 8	5 40	8 6	4 23	21 2	4 58	20 7	11 27	16 1	—	—
M.	23	7 41	6 19	8 4	6 58	8 3	5 42	20 4	6 27	20 4	0 2	15 9	0 39	15 8
Tu.	24	8 27	7 35	8 3	8 11	8 4	7 4	20 7	7 40	21 0	1 19	15 9	2 0	16 1
W.	25	9 11	8 45	8 6	9 15	8 8	8 14	21 6	8 41	22 0	2 37	16 6	3 10	17 0
Th.	26	9 55	9 42	8 10	10 6	8 11	9 5	22 7	9 27	23 1	3 38	17 8	4 4	18 2
F.	27	10 38	10 27	9 0	10 47	9 1	9 47	23 7	10 4	24 0	4 27	18 7	4 49	19 0
S.	28	11 21	11 7	9 2	11 26	9 3	10 22	24 4	10 39	24 7	5 10	19 5	5 30	19 8
S.	29	morn.	11 44	9 4	—	—	10 56	24 9	11 13	24 10	5 48	19 10	6 5	20 0
M.	30	0 5	0 2	9 4	0 18	9 5	11 30	24 11	11 47	25 0	6 21	20 1	6 38	20 1

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	8	8	42	Morning.
New - - - - -	15	7	3	Morning.
First Quarter -	21	10	31	Afternoon.
Full - - - - -	29	9	23	Afternoon.
In Apogee - -	3	5	0	Morning.
In Perigee - -	15	10	0	Afternoon.
In Apogee - -	30	10	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	8	49	9	14	43	17	16	N. 5	25	3	N. 9
2	11	55	10	11	51	18	17	49	26	0	8 40
3	14	31	11	8	15	19	18	19	27	4	24
4	16	30	12	4	5	20	17	40	28	7	57
5	17	47	13	0	N. 27	21	15	59	29	11	10
6	18	18	14	5	5	22	13	30	30	13	55
7	17	58	15	9	27	23	10	24			
8	16	47	16	13	13	24	6	54			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
S.	1	7 33 36 11	7 50 36 10	10 46 15 10	11 2 15 9	11 46 10 11	—	—	15 6					
M.	2	8 4 36 7	8 19 36 3	11 16 15 8	11 31 15 6	0 3 10 10	0 19 10 9	16 6						
Tu.	3	8 33 35 10	8 48 35 5	11 47 15 3	—	—	0 35 10 7	0 51 10 6	17 6					
W.	4	9 3 34 11	9 17 34 4	0 4 15 1	0 21 14 10	1 7 10 4	1 24 10 2	18 6						
Th.	5	9 32 33 7	9 47 32 9	0 39 14 6	0 58 14 2	1 41 9 11	1 58 9 9	19 6						
F.	6	10 3 31 11	10 19 30 11	1 18 13 10	1 39 13 6	2 18 9 7	2 39 9 5	20 6						
S.	7	10 37 30 0	10 59 29 1	2 2 13 1	2 26 12 9	3 1 9 3	3 25 9 0	21 6						
S.	8	11 28 28 4	—	—	2 55 12 6	3 13 12 3	3 54 8 10	4 29 8 8	22 6					
M.	9	0 1 27 9	0 38 27 8	4 9 12 1	4 51 12 2	5 5 8 7	5 42 8 7	23 6						
Tu.	10	1 19 27 11	1 58 28 7	5 32 12 4	6 8 12 9	6 20 8 9	6 55 8 11	24 6						
W.	11	2 8 29 6	3 14 30 10	6 42 13 2	7 13 13 8	7 29 9 2	8 1 9 6	25 6						
Th.	12	3 49 32 1	4 22 33 6	7 40 14 2	8 6 14 9	8 31 9 10	9 0 10 2	26 6						
F.	13	4 52 35 0	5 19 36 5	8 29 15 4	8 49 15 10	9 26 10 6	9 49 10 9	27 6						
S.	14	5 44 37 8	6 9 38 9	9 9 16 4	9 31 16 9	10 9 11 1	10 29 11 4	28 6						
S.	15	6 33 39 6	6 57 40 1	9 53 17 1	10 15 17 4	10 50 11 6	11 12 11 8	29 6						
M.	16	7 21 40 6	7 44 40 8	10 35 17 5	10 56 17 5	11 34 11 9	11 57 11 8	30 6						
Tu.	17	8 6 40 5	8 28 40 0	11 18 17 3	11 42 17 1	—	0 20 11 7	31 6						
W.	18	8 50 39 4	9 11 38 6	—	0 6 16 9	0 45 11 5	1 10 11 3	32 6						
Th.	19	9 32 37 5	9 53 36 1	0 31 16 4	0 57 15 10	1 84 11 0	1 58 10 8	33 6						
F.	20	10 14 34 8	10 36 33 2	1 24 15 2	1 52 14 8	2 24 10 4	2 52 10 1	34 6						
S.	21	11 1 31 11	11 28 30 8	2 21 14 1	2 54 13 7	3 20 9 9	3 52 9 6	35 6						
S.	22	11 59 29 8	—	—	3 30 13 2	4 7 12 11	4 28 9 3	36 6						
M.	23	0 38 29 1	1 18 28 11	4 51 12 9	5 31 12 10	5 42 8 11	6 19 9 0	37 6						
Tu.	24	1 56 29 1	2 33 29 6	6 6 12 11	6 39 13 2	6 43 9 1	7 26 9 3	38 6						
W.	25	3 10 30 2	3 44 30 9	7 10 13 5	7 37 13 8	7 58 9 5	8 27 9 7	39 6						
Th.	26	4 16 31 8	4 43 32 6	8 1 14 0	8 23 14 3	8 54 9 9	9 19 9 11	40 6						
F.	27	5 8 33 3	5 30 34 0	8 42 14 7	9 0 14 10	9 41 10 1	9 59 10 2	41 6						
S.	28	5 51 34 7	6 11 35 0	9 17 15 0	9 34 15 2	10 16 10 4	10 31 10 6	42 6						
S.	29	6 30 35 4	6 48 35 6	9 50 15 4	10 6 15 4	10 47 10 7	11 3 10 8	43 6						
M.	30	7 5 35 7	7 22 35 9	10 21 15 5	10 36 15 5	11 18 10 8	11 34 10 8	44 6						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	58	Sub.	9	1	37	Sub.	17	0	27	Add.	25	2	7	Add.
2	3	39		10	1	20		18	0	41		26	2	17	
3	3	21		11	1	4		19	0	54		27	2	27	
4	3	3		12	0	48		20	1	7		28	2	37	
5	2	46		13	0	32		21	1	20		29	2	46	
6	2	28		14	0	17		22	1	32		30	2	54	
7	2	11		15	0	2		23	1	44					
8	1	54		16	0	13	Add.	24	1	56					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	MOON'S 'TRANSIT.	GREENOCK.						LIVERPOOL.						PEMBROKE.								
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.					
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.					
S.	1	om39	0 30	9	8	0 47	9	8	11 58	25	9	—	—	6 49	20	10	7 6	20	9				
M.	2	1 23	1 4	9	8	1 20	9	7	0 15	25	8	0 30	25	6	7 21	20	7	7 36	20	4			
Tu.	3	2 8	1 35	9	6	1 50	9	6	0 46	25	3	1 1	24	11	7 50	20	0	8 6	19	9			
W.	4	2 53	2 6	9	5	2 21	9	4	1 16	24	7	1 32	24	1	8 23	19	4	8 39	18	11			
Th.	5	3 40	2 37	9	3	2 53	9	1	1 48	23	6	2 4	23	0	8 56	18	6	9 13	18	0			
F.	6	4 27	3 10	8	11	3 29	8	10	2 21	22	5	2 40	21	10	9 31	17	5	9 50	16	11			
S.	7	5 16	3 50	8	8	4 12	8	6	3 1	21	3	3 23	20	8	10 10	16	5	10 32	15	10			
S.	8	6 5	4 37	8	5	5 8	8	3	3 50	20	1	4 23	19	7	10 58	15	3	11 28	14	11			
M.	9	6 55	5 41	8	2	6 19	8	1	5 0	19	3	5 42	19	4	—	—	0	0 2	14	11			
Tu.	10	7 46	6 59	8	0	7 37	8	2	6 27	19	8	7 7	20	3	0 40	15	1	1 22	15	5			
W.	11	8 37	8 14	8	5	8 48	8	8	7 43	21	0	8 17	22	0	2 4	16	1	2 41	16	11			
Th.	12	9 29	9 19	8	11	9 47	9	2	8 44	22	11	9 10	23	11	3 14	17	10	3 44	18	10			
F.	13	10 22	10 13	9	5	10 36	9	7	9 33	24	10	9 54	25	9	4 12	19	8	4 38	20	6			
S.	14	11 17	11 0	9	9	11 24	9	11	10 14	26	6	10 37	27	1	5 3	21	4	5 28	21	11			
S.	15	om14	11 48	10	2	—	—	11 0	27	8	11 23	28	1	5 52	22	5	6 15	22	10				
M.	16	1 12	0 12	10	3	0 35	10	4	11 46	28	3	—	—	6 37	23	0	7 0	23	1				
Tu.	17	2 12	0 58	10	4	1 22	10	4	0 9	28	4	0 32	28	2	7 22	22	11	7 45	22	7			
W.	18	3 12	1 45	10	3	2 8	10	2	0 56	27	10	1 19	27	3	8 9	22	1	8 32	21	6			
Th.	19	4 11	2 30	10	0	2 53	9	10	1 40	26	6	2 3	25	8	8 55	20	10	9 18	20	0			
F.	20	5 8	3 17	9	7	3 42	9	4	2 27	24	9	2 52	23	10	9 42	19	2	10 7	18	4			
S.	21	6 2	4 9	9	2	4 38	8	11	3 20	22	10	3 49	22	0	10 33	17	7	10 59	16	9			
S.	22	6 53	5 8	8	8	5 40	8	6	4 23	21	2	4 58	20	2	11 27	16	1	—	—	—			
M.	23	7 41	6 19	8	4	6 58	8	3	5 42	20	4	6 27	20	4	0 2	15	9	0 39	15	8			
Tu.	24	8 27	7 35	8	3	8 11	8	4	7 4	20	7	7 40	21	0	1 19	15	9	2 0	16	1			
W.	25	9 11	8 45	8	6	9 15	8	8	8 14	21	6	8 41	22	0	2 37	16	6	3 10	17	0			
Th.	26	9 55	9 42	8	10	10 6	8	11	9 5	22	7	9 27	23	1	3 38	17	8	4 4	18	2			
F.	27	10 38	10 27	9	0	10 47	9	1	9 47	23	7	10 4	24	0	4 27	18	7	4 49	19	0			
S.	28	11 21	11 7	9	2	11 26	9	3	10 22	24	4	10 39	24	7	5 10	19	5	5 30	19	8			
S.	29	morn.	11 44	9	4	—	—	10 56	24	9	11 13	24	10	5 48	19	10	6 5	20	0				
M.	30	0 5	0 2	9	4	0 18	9	5	11 30	24	11	11 47	25	0	6 21	20	1	6 38	20	1			
Half Mean Spring } Range.			4ft. 10in.						13ft. 0in.						10ft. 6in.								
Phases of the Moon.												Moon's Declination at Noon.											
D. H. M.												M.D. ° ' "											
Last Quarter - 8 8 42 Morning.												1 8 8.49 9 14 8.43 17 16 N. 5 25 3 N. 9											
New - - - - - 15 7 3 Morning.												2 11 55 10 11 51 18 17 49 26 0 8 40											
First Quarter - 21 10 31 Afternoon.												3 14 31 11 8 15 19 18 19 27 4 24											
Full - - - - - 29 9 23 Afternoon.												4 16 30 12 4 5 20 17 40 28 7 57											
												5 17 47 13 0 N.27 21 15 59 29 11 10											
In Apogee- - 3 5 0 Morning.												6 18 18 14 5 5 22 13 30 30 13 55											
In Perigee - - 15 10 0 Afternoon.												7 17 58 15 9 27 23 10 24											
In Apogee - - 30 10 0 Morning.												8 16 47 16 13 13 24 6 54											

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
S.	1	7	33	36	11	7	50	36	10	10	46	15	10	11	2	15	9	11	46	10	11	—	—	—	—	15.6
M.	2	8	4	36	7	8	19	36	3	11	16	15	8	11	31	15	6	0	3	10	10	0	19	10	9	16.6
Tu.	3	8	33	35	10	8	48	35	5	11	47	15	3	—	—	—	—	0	35	10	7	0	51	10	6	17.6
W.	4	9	3	34	11	9	17	34	4	0	4	15	1	0	21	14	10	1	7	10	4	1	24	10	2	18.6
Th.	5	9	32	33	7	9	47	32	9	0	39	14	6	0	58	14	2	1	41	9	11	1	58	9	9	19.6
F.	6	10	3	31	11	10	19	30	11	1	18	13	10	1	39	13	6	2	18	9	7	2	39	9	5	20.6
S.	7	10	37	30	0	10	59	29	1	2	2	13	1	2	26	12	9	3	1	9	3	3	25	9	0	21.6
S.	8	11	28	28	4	—	—	—	—	2	55	12	6	3	13	12	3	3	54	8	10	4	29	8	8	—
M.	9	0	1	27	9	0	38	27	8	4	9	12	1	4	51	12	2	5	5	8	7	5	42	8	7	23.6
Tu.	10	1	19	27	11	1	58	28	7	5	32	12	4	6	8	12	9	6	20	8	9	6	55	8	11	24.6
W.	11	2	37	29	6	3	14	30	10	6	42	13	2	7	13	13	8	7	29	9	2	8	1	9	6	25.6
Th.	12	3	49	32	1	4	22	33	6	7	40	14	2	8	6	14	9	8	31	9	10	9	0	10	2	26.6
F.	13	4	52	35	0	5	19	36	5	8	29	15	4	8	49	15	10	9	26	10	6	9	49	10	9	27.6
S.	14	5	44	37	8	6	9	38	9	9	9	16	4	9	31	16	9	10	9	11	1	10	29	11	4	28.6
S.	15	6	33	39	6	6	57	40	1	9	53	17	1	10	15	17	4	10	50	11	6	11	12	11	8	●
M.	16	7	21	40	6	7	44	40	8	10	35	17	5	10	56	17	5	11	34	11	9	11	57	11	8	1.2
Tu.	17	8	6	40	5	8	28	40	0	11	18	17	3	11	42	17	1	—	—	—	—	0	20	11	7	2.2
W.	18	8	50	39	4	9	11	38	6	—	—	—	—	0	6	16	9	0	45	11	5	1	10	11	3	3.2
Th.	19	9	32	37	5	9	53	36	1	0	31	16	4	0	57	15	10	1	34	11	0	1	58	10	8	4.2
F.	20	10	14	34	8	10	36	33	2	1	24	15	2	1	52	14	8	2	24	10	4	2	52	10	1	5.2
S.	21	11	1	31	11	11	28	30	8	2	21	14	1	2	54	13	7	3	20	9	9	3	52	9	6	—
S.	22	11	59	29	8	—	—	—	—	3	30	13	2	4	7	12	11	4	28	9	3	5	4	9	0	7.2
M.	23	0	38	29	1	1	18	28	11	4	51	12	9	5	31	12	10	5	42	8	11	6	19	9	0	8.2
Tu.	24	1	56	29	1	2	33	29	6	6	6	12	11	6	39	13	2	6	43	9	1	7	26	9	3	9.2
W.	25	3	10	30	2	3	44	30	9	7	10	13	5	7	37	13	8	7	58	9	5	8	27	9	7	10.2
Th.	26	4	16	31	8	4	43	32	6	8	1	14	0	8	23	14	3	8	54	9	9	9	19	9	11	11.2
F.	27	5	8	33	3	5	30	34	0	8	42	14	7	9	0	14	10	9	41	10	1	9	59	10	2	12.2
S.	28	5	51	34	7	6	11	35	0	9	17	15	0	9	34	15	2	10	16	10	4	10	31	10	6	13.2
S.	29	6	30	35	4	6	48	35	6	9	50	15	4	10	6	15	4	10	47	10	7	11	3	10	8	○
M.	30	7	5	35	7	7	22	35	9	10	21	15	5	10	36	15	5	11	18	10	8	11	34	10	8	15.2
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	58	Sub.	9	1	37	Sub.	17	0	27	Add.	25	2	7	Add.
2	3	39		10	1	20		18	0	41		26	2	17	
3	3	21		11	1	4		19	0	54		27	2	27	
4	3	3		12	0	48		20	1	7		28	2	37	
5	2	46		13	0	32		21	1	20		29	2	46	
6	2	28		14	0	17		22	1	32		30	2	54	
7	2	11		15	0	2		23	1	44					
8	1	54		16	0	13	Add.	24	1	56					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	om39	11 24	9 5	11 40	9 4	8 36	7 8	8 52	7 7	5 54	11 2	6 10	11 1
M.	2	1 23	11 55	9 4	—	—	9 6	7 6	9 20	7 4	6 25	10 11	6 40	10 9
Tu.	3	2 8	0 10	9 3	0 26	9 2	9 34	7 2	9 49	7 0	6 56	10 7	7 12	10 4
W.	4	2 53	0 43	9 1	1 0	9 0	10 4	6 10	10 20	6 8	7 28	10 0	7 44	9 9
Th.	5	3 40	1 17	8 11	1 37	8 10	10 37	6 6	10 56	6 3	8 0	9 5	8 19	9 2
F.	6	4 27	1 58	8 8	2 21	8 6	11 21	6 0	11 49	5 9	8 40	8 11	9 4	8 7
S.	7	5 16	2 44	8 4	3 9	8 3	—	—	0 21	5 6	9 32	8 4	10 3	8 2
S.	8	6 5	3 37	8 1	4 10	8 0	0 56	5 4	1 38	5 3	10 40	8 0	11 18	7 11
M.	9	6 55	4 46	7 11	5 24	7 11	2 21	5 3	3 1	5 5	11 57	8 0	—	—
Tu.	10	7 46	6 2	7 11	6 39	8 0	3 39	5 9	4 12	6 0	0 36	8 2	1 13	8 4
W.	11	8 37	7 15	8 2	7 47	8 4	4 41	6 3	5 6	6 7	1 48	8 8	2 20	9 1
Th.	12	9 29	8 14	8 7	8 39	8 10	5 28	6 10	5 50	7 1	2 46	9 7	3 10	10 0
F.	13	10 22	9 3	9 2	9 24	9 5	6 13	7 5	6 35	7 8	3 32	10 6	3 51	10 11
S.	14	11 17	9 46	9 7	10 8	9 9	6 57	7 11	7 20	8 1	4 11	11 4	4 33	11 8
S.	15	0a14	10 29	9 11	10 51	9 11	7 43	8 3	8 5	8 5	4 56	12 0	5 20	12 2
M.	16	1 12	11 13	10 0	11 34	9 11	8 26	8 6	8 46	8 6	5 43	12 3	6 4	12 3
Tu.	17	2 12	11 56	9 11	—	—	9 7	8 4	9 29	8 2	6 26	12 1	6 50	11 10
W.	18	3 12	0 21	9 10	0 45	9 8	9 51	7 11	10 13	7 8	7 14	11 6	7 36	11 1
Th.	19	4 11	1 10	9 7	1 36	9 5	10 36	7 4	11 3	7 0	7 59	10 8	8 25	10 2
F.	20	5 8	2 5	9 2	2 34	8 11	11 36	6 8	—	—	8 53	9 9	9 25	9 4
S.	21	6 2	3 4	8 9	3 36	8 6	0 12	6 3	0 53	6 0	10 1	9 0	10 38	8 9
S.	22	6 53	4 10	8 4	4 44	8 3	1 35	5 10	2 19	5 9	11 16	8 6	11 57	8 5
M.	23	7 41	5 24	8 2	6 1	8 1	3 1	5 9	3 38	5 11	—	—	0 35	8 5
Tu.	24	8 27	6 37	8 1	7 12	8 2	4 8	6 1	4 37	6 3	1 11	8 6	1 45	8 8
W.	25	9 11	7 44	8 3	8 11	8 5	5 3	6 5	5 25	6 6	2 17	8 11	2 43	9 2
Th.	26	9 55	8 35	8 7	8 57	8 9	5 46	6 8	6 7	6 10	3 6	9 5	3 27	9 8
F.	27	10 38	9 17	8 11	9 35	9 0	6 27	7 0	6 46	7 1	3 44	9 11	4 1	10 2
S.	28	11 21	9 53	9 1	10 10	9 2	7 5	7 2	7 23	7 3	4 19	10 5	4 36	10 7
S.	29	morn.	10 26	9 3	10 42	9 3	7 40	7 4	7 56	7 4	4 53	10 8	5 10	10 9
M.	30	0 5	10 57	9 3	11 13	9 3	8 11	7 5	8 26	7 5	5 27	10 10	5 43	10 10

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	8	8	42 Morning.	1	8	8.49	9	14	S.43	17	16	N.5	25	3	N.9
New - - - - -	15	7	3 Morning.	2	11	55	10	11	51	18	17	49	26	0	S.40
First Quarter	21	10	31 Afternoon.	3	14	31	11	8	15	19	18	19	27	4	24
Full - - - - -	29	9	23 Afternoon.	4	16	30	12	4	5	20	17	40	28	7	57
				5	17	47	13	0	N.27	21	15	59	29	11	10
In Apogee - -	3	5	0 Morning.	6	18	18	14	.5	5	22	13	30	30	13	55
In Perigee - -	15	10	0 Afternoon.	7	17	58	15	9	27	23	10	24			
In Apogee - -	30	10	0 Morning.	8	16	47	16	13	13	24	6	54			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,— for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

APRIL, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.										
S.	1	5	13	14	8	5	30	14	7	5	39	11	8	5	56	11	7	5	59	12	4	6	16	12	3	15.6	
M.	2	5	45	14	5	6	1	14	3	6	12	11	6	6	27	11	5	6	32	12	3	6	48	12	2	16.6	
Tu.	3	6	16	14	1	6	32	13	10	6	42	11	3	6	58	11	2	7	4	12	0	7	19	11	11	17.6	
W.	4	6	49	13	6	7	6	13	2	7	14	10	11	7	30	10	8	7	35	11	9	7	50	11	7	18.6	
Th.	5	7	23	12	10	7	43	12	5	7	46	10	5	8	3	10	3	8	6	11	5	8	22	11	2	19.6	
F.	6	8	4	12	0	8	26	11	7	8	21	10	0	8	40	9	8	8	39	10	11	8	57	10	8	20.6	
S.	7	8	50	11	1	9	16	10	8	9	2	9	5	9	24	9	2	9	16	10	5	9	40	10	2	21.6	
S.	8	9	49	10	5	10	26	10	3	9	52	8	11	10	25	8	10	10	12	9	11	10	47	9	8	(
M.	9	11	6	10	4	11	48	10	7	11	4	8	9	11	45	8	10	11	24	9	7	—	—	—	—	23.6	
Tu.	10	—	—	—	—	0	25	10	11	—	—	—	—	0	23	9	1	0	1	9	8	0	36	9	10	24.6	
W.	11	1	0	11	5	1	31	12	0	1	1	9	5	1	38	9	9	1	11	10	1	1	46	10	6	25.6	
Th.	12	1	58	12	7	2	24	13	3	2	10	10	2	2	39	10	7	2	20	10	11	2	52	11	5	26.6	
F.	13	2	48	13	10	3	11	14	5	3	6	11	0	3	30	11	6	3	21	11	10	3	48	12	3	27.6	
S.	14	3	32	14	11	3	54	15	5	3	53	11	11	4	16	12	2	4	13	12	8	4	39	12	11	28.6	
S.	15	4	16	15	10	4	38	16	2	4	39	12	6	5	3	12	8	5	3	13	2	5	26	13	3	●	
M.	16	5	1	16	4	5	24	16	5	5	27	12	9	5	51	12	10	5	48	13	5	6	11	13	6	1.2	
Tu.	17	5	47	16	3	6	11	16	0	6	14	12	9	6	37	12	7	6	35	13	5	6	59	13	4	2.2	
W.	18	6	35	15	7	6	59	15	2	7	0	12	4	7	23	12	0	7	22	13	1	7	44	12	11	3.2	
Th.	19	7	23	14	7	7	50	14	0	7	46	11	8	8	9	11	3	8	6	12	7	8	28	12	3	4.2	
F.	20	8	17	13	3	8	45	12	7	8	32	10	10	8	58	10	4	8	50	11	10	9	14	11	5	5.2	
S.	21	9	16	12	0	9	49	11	6	9	25	10	0	9	53	9	8	9	40	11	0	10	12	10	7)	
S.	22	10	24	11	2	11	6	11	0	10	24	9	5	11	4	9	3	10	46	10	3	11	24	10	0	7.2	
M.	23	11	47	11	0	—	—	—	—	11	44	9	2	—	—	—	—	12	0	9	11	—	—	—	—	8.2	
Tu.	24	0	22	11	2	0	57	11	5	0	21	9	3	0	57	9	5	0	34	10	0	1	8	10	1	9.2	
W.	25	1	28	11	8	1	54	12	0	1	33	9	7	2	6	9	9	1	42	10	4	2	15	10	7	10.2	
Th.	26	2	18	12	4	2	41	12	8	2	34	10	0	2	58	10	3	2	46	10	10	3	13	11	1	11.2	
F.	27	3	3	13	0	3	21	13	3	3	21	10	6	3	41	10	9	3	37	11	3	3	59	11	6	12.2	
S.	28	3	39	13	6	3	56	13	9	4	0	10	11	4	18	11	1	4	20	11	8	4	41	11	9	13.2	
S.	29	4	13	13	11	4	29	14	0	4	36	11	2	4	54	11	3	4	59	11	10	5	16	11	11	○	
M.	30	4	45	14	1	5	1	14	2	5	11	11	4	5	28	11	4	5	32	11	11	5	48	11	11	15.2	
Half Mean Spring Range.		7ft. 5in.								5ft 10in.								6ft. 2in.									
Equation of Time at Noon.																											
M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	3	58		9	1	37		17	0	27		25	2	7		25	2	7		25	2	7		25	2	7	
2	3	39		10	1	20		18	0	41		26	2	17		26	2	17		26	2	17		26	2	17	
3	3	21		11	1	4		19	0	54		27	2	27		27	2	27		27	2	27		27	2	27	
4	3	3		12	0	48		20	1	7		28	2	37		28	2	37		28	2	37		28	2	37	
5	2	46		13	0	32		21	1	20		29	2	46		29	2	46		29	2	46		29	2	46	
6	2	28		14	0	17		22	1	32		30	2	54		30	2	54		30	2	54		30	2	54	
7	2	11		15	0	2		23	1	44																	
8	1	54	16	0	13	Add.	24	1	56																		

he times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

MAY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.						
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
Tu.	1	om 50	0 40	11	3	0 56	11	3	7 15	20	1	7 32	20	0	4 6	13	10	4 22	13	10	
W.	2	1 37	1 13	11	2	1 29	11	1	7 48	19	11	8 3	19	9	4 37	13	9	4 53	13	7	
Th.	3	2 24	1 45	11	0	2 1	10	11	8 19	19	7	8 36	19	5	5 9	13	5	5 26	13	2	
F.	4	3 12	2 18	10	9	2 35	10	8	8 53	19	1	9 11	18	8	5 43	12	11	6 2	12	8	
S.	5	4 1	2 53	10	6	3 12	10	4	9 30	18	4	9 50	18	0	6 22	12	5	6 45	12	2	
S.	6	4 50	3 32	10	3	3 53	10	1	10 13	17	7	10 37	17	2	7 9	11	11	7 34	11	7	
M.	7	5 39	4 16	9	11	4 41	9	10	11 7	16	11	11 41	16	7	8 0	11	5	8 30	11	3	
Tu.	8	6 28	5 9	9	9	5 40	9	8	—	—	—	0 16	16	5	9 2	11	1	9 39	11	1	
W.	9	7 19	6 14	9	9	6 54	9	10	0 52	16	5	1 26	16	7	10 16	11	2	10 51	11	4	
Th.	10	8 9	7 32	10	0	8 7	10	3	1 59	16	10	2 31	17	5	11 24	11	8	11 54	12	1	
F.	11	9 1	8 40	10	6	9 9	10	9	3 2	18	1	3 31	18	10	—	—	—	0 21	12	7	
S.	12	9 56	9 38	11	0	10 6	11	4	3 59	19	6	4 26	20	1	0 49	13	1	1 16	13	7	
S.	13	10 53	10 32	11	7	10 57	11	10	4 50	20	8	5 14	21	2	1 43	14	0	2 9	14	4	
M.	14	11 52	11 22	12	0	11 48	12	2	5 39	21	7	6 5	21	11	2 35	14	9	3 0	15	0	
Tu.	15	om 53	—	—	—	0 13	12	3	6 31	22	1	6 56	22	3	3 23	15	2	3 46	15	6	
W.	16	1 55	0 37	12	3	1 1	12	2	7 20	22	3	7 44	22	2	4 10	15	5	4 33	15	4	
Th.	17	2 55	1 25	12	0	1 48	11	10	8 7	21	11	8 30	21	6	4 56	15	1	5 20	14	9	
F.	18	3 53	2 12	11	8	2 37	11	6	8 54	21	0	9 20	20	5	5 45	14	4	6 11	13	11	
S.	19	4 47	3 2	11	3	3 28	11	0	9 46	19	10	10 12	19	3	6 39	13	6	7 7	13	1	
S.	20	5 37	3 53	10	9	4 19	10	6	10 40	18	7	11 11	18	0	7 35	12	7	8 4	12	2	
M.	21	6 24	4 45	10	3	5 14	10	1	11 45	17	6	—	—	—	8 35	11	10	9 6	11	7	
Tu.	22	7 10	5 43	10	0	6 14	9	10	0 19	17	1	0 52	16	9	9 39	11	4	10 14	11	3	
W.	23	7 53	6 51	9	10	7 27	9	11	1 24	16	8	1 54	16	8	10 46	11	2	11 17	11	4	
Th.	24	8 36	8 0	10	0	8 32	10	1	2 24	16	10	2 54	17	2	11 46	11	6	—	—	—	
F.	25	9 20	9 1	10	2	9 28	10	4	3 22	17	6	3 50	17	10	0 13	11	8	0 39	11	11	
S.	26	10 3	9 54	10	6	10 19	10	7	4 15	18	3	4 38	18	6	1 4	12	2	1 28	12	5	
S.	27	10 48	10 41	10	9	11 1	10	10	4 58	18	9	5 18	19	0	1 51	12	7	2 13	12	9	
M.	28	11 34	11 22	11	0	11 40	11	1	5 37	19	2	5 56	19	4	2 34	12	11	2 52	13	1	
Tu.	29	morn.	11 58	11	1	—	—	—	6 15	19	5	6 34	19	6	3 9	13	3	3 26	13	4	
W.	30	0 21	0 16	11	1	0 34	11	1	6 52	19	7	7 10	19	7	3 44	13	5	4 1	13	6	
Th.	31	1 9	0 51	11	1	1 8	11	0	7 27	19	7	7 44	19	7	4 17	13	6	4 33	13	6	
Half Mean Spring } Range.			5ft. 9in.						10ft. 5in.						7ft. 2in.						
Phases of the Moon.										Moon's Declination at Noon.											
D. H. M.										M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 7 9 42 Afternoon.										1	16	s. 6	9	5	s. 48	17	18	N. 9	25	7	s. 1
New - - - - - 14 2 58 Afternoon.										2	17	35	10	1	30	18	16	48	26	10	21
First Quarter - 21 9 58 Morning.										3	18	19	11	3	N. 2	19	14	30	27	13	15
Full - - - - - 29 1 18 Afternoon.										4	18	13	12	7	30	20	11	29	28	15	37
										5	17	17	13	11	35	21	8	0	29	17	20
										6	15	31	14	14	57	22	4	15	30	18	18
In Perigee - - 14 9 0 Morning.										7	12	57	15	17	16	23	0	24	31	18	26
In Apogee - - 27 1 0 Afternoon.										8	9	40	16	18	21	24	3	s. 24			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MAY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
Tu.	1	om 50	0	35	9	5	0	52	9	5	—	—	0	4	24	11	6	54	20	0	7	10	19	11		
W.	2	1 37	1	9	9	5	1	25	9	4	0	20	24	9	0	36	24	7	7	25	19	9	7	41	19	6
Th.	3	2 24	1	41	9	4	1	58	9	3	0	52	24	4	1	8	24	1	7	58	19	3	8	15	19	0
F.	4	3 12	2	14	9	2	2	31	9	1	1	24	23	8	1	41	23	3	8	33	18	8	8	52	18	3
S.	5	4 1	2	50	9	0	3	9	8	11	2	0	22	9	2	20	22	4	9	11	17	10	9	31	17	5
♄.	6	4 50	3	30	8	10	3	53	8	9	2	41	21	10	3	4	21	4	9	52	17	0	10	15	16	8
M.	7	5 39	4	17	8	7	4	44	8	6	3	28	20	11	3	58	20	6	10	39	16	3	11	4	15	11
Tu.	8	6 28	5	15	8	5	5	48	8	4	4	29	20	3	5	8	20	2	11	34	15	9	—	—	—	—
W.	9	7 18	6	23	8	4	6	58	8	4	5	47	20	5	6	27	20	10	0	6	15	11	0	40	16	1
Th.	10	8 9	7	33	8	6	8	8	8	8	7	3	21	5	7	36	22	2	1	19	16	6	1	57	17	1
F.	11	9 1	8	38	8	11	9	8	9	2	8	5	23	0	8	33	23	10	2	31	17	10	3	4	18	8
S.	12	9 56	9	36	9	4	10	3	9	6	8	59	24	8	9	23	25	5	3	34	19	6	4	3	20	2
♄.	13	10 53	10	29	9	8	10	56	9	10	9	47	26	1	10	11	26	8	4	31	20	11	4	59	21	6
M.	14	11 52	11	23	10	0	11	50	10	1	10	37	27	2	11	2	27	6	5	27	22	0	5	54	22	4
Tu.	15	0 8 53	—	—	—	—	0	15	10	2	11	27	27	9	11	52	27	9	6	18	22	7	6	42	22	7
W.	16	1 55	0	40	10	3	1	5	10	2	—	—	—	—	0	16	27	8	7	6	22	6	7	29	22	2
Th.	17	2 55	1	29	10	1	1	52	10	0	0	39	27	4	1	3	26	10	7	53	21	9	8	17	21	3
F.	18	3 53	2	16	9	11	2	40	9	9	1	26	26	2	1	50	25	6	8	42	20	8	9	7	20	0
S.	19	4 47	3	5	9	7	3	30	9	4	2	15	24	8	2	40	23	11	9	31	19	3	9	56	18	7
♄.	20	5 37	3	56	9	2	4	22	9	0	3	6	23	2	3	33	22	4	10	20	17	11	10	44	17	3
M.	21	6 24	4	50	8	10	5	18	8	8	4	3	21	8	4	34	21	1	11	8	16	8	11	34	16	2
Tu.	22	7 10	5	48	8	6	6	21	8	4	5	8	20	8	5	44	20	6	—	—	—	—	0	4	16	0
W.	23	7 53	6	53	8	3	7	25	8	4	6	21	20	7	6	56	20	9	0	35	15	10	1	11	15	11
Th.	24	8 36	7	59	8	5	8	29	8	6	7	28	21	0	7	57	21	4	1	47	16	1	2	20	16	5
F.	25	9 20	8	58	8	7	9	25	8	8	8	25	21	9	8	49	22	2	2	52	16	9	3	20	17	3
S.	26	10 3	9	48	8	9	10	11	8	10	9	11	22	7	9	31	22	11	3	46	17	7	4	10	18	0
♄.	27	10 48	10	33	8	11	10	54	9	0	9	51	23	4	10	10	23	7	4	34	18	4	4	57	18	8
M.	28	11 34	11	13	9	1	11	33	9	1	10	28	23	10	10	47	24	0	5	18	19	0	5	38	19	2
Tu.	29	morn.	11	53	9	2	—	—	—	—	11	6	24	1	11	24	24	3	5	57	19	4	6	16	19	5
W.	30	0 21	0	12	9	2	0	30	9	3	11	42	24	4	11	59	24	4	6	33	19	6	6	50	19	7
Th.		1 9	0	47	9	3	1	4	9	3	—	—	—	—	0	16	24	4	7	6	19	6	7	22	19	5
Half Mean Spring Range.			4ft. 10in.								13ft. 0in.								10ft. 6in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
Last Quarter - 7 9 42 Afternoon.												1 16 s. 6 9 5 s. 48 17 18 N. 9 25 7 s. 1														
New - - - - - 14 2 58 Afternoon.												2 17 35 10 1 30 18 16 48 26 10 21														
First Quarter - 21 9 58 Morning.												3 18 19 11 3 N. 2 19 14 30 27 13 15														
Full - - - - - 29 1 18 Afternoon.												4 18 13 12 7 30 20 11 29 28 15 37														
In Perigee - - 14 9 0 Morning.												5 17 17 13 11 35 21 8 0 29 17 20														
In Apogee - - 27 1 0 Afternoon.												6 15 31 14 14 57 22 4 15 30 18 18														
												7 12 57 15 17 16 23 0 24 31 18 26														
												8 9 40 16 18 21 24 3 s. 24														

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

MAY, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	
Tu.	1	7 38	35 9	7 53	35 6	10 51	15 4	11 5	15 3	11 51	10 7	—	—	16.2
W.	2	8 9	35 3	8 24	35 0	11 20	15 1	11 37	14 11	0 8	10 6	0 24	10 5	17.2
Th.	3	8 40	34 9	8 55	34 4	11 56	14 9	—	—	0 41	10 3	0 59	10 2	18.2
F.	4	9 11	33 10	9 28	33 3	0 14	14 6	0 33	14 3	1 17	10 0	1 35	9 10	19.2
S.	5	9 46	32 7	10 3	31 10	0 54	14 0	1 17	13 9	1 54	9 8	2 17	9 7	20.2
S.	6	10 21	31 1	10 41	30 5	1 40	13 5	2 5	13 2	2 40	9 5	3 4	9 3	21.2
M.	7	11 6	29 9	11 35	29 4	2 32	12 11	3 3	12 9	3 30	9 2	4 2	9 0	22.2
Tu.	8	—	—	0 8	29 1	3 38	12 8	4 17	12 8	4 36	8 11	5 11	8 10	23.2
W.	9	0 42	29 2	1 18	29 7	4 55	12 10	5 31	13 1	5 46	8 11	6 19	9 1	24.2
Th.	10	1 54	30 3	2 29	31 2	6 4	13 5	6 35	13 10	6 51	9 4	7 21	9 7	25.2
F.	11	3 3	32 3	3 38	33 5	7 2	14 3	7 29	14 9	7 50	9 11	8 20	10 2	26.2
S.	12	4 12	34 7	4 42	35 10	7 55	15 3	8 19	15 8	8 49	10 5	9 16	10 8	27.2
S.	13	5 12	37 0	5 41	38 0	8 42	16 1	9 6	16 6	9 42	10 11	10 5	11 2	28.2
M.	14	6 9	38 10	6 36	39 3	9 31	16 10	9 55	17 0	10 28	11 4	10 52	11 6	29.2
Tu.	15	7 1	39 8	7 26	39 10	10 17	17 1	10 39	17 11	11 15	11 7	11 39	11 6	30.2
W.	16	7 49	39 8	8 12	39 3	11 1	17 0	11 24	16 9	—	—	0 4	11 5	31.2
Th.	17	8 35	38 8	8 57	37 11	11 49	16 5	—	—	0 28	11 4	0 53	11 2	32.2
F.	18	9 20	37 1	9 43	36 0	0 15	16 1	0 43	15 8	1 18	10 11	1 44	10 7	33.2
S.	19	10 5	34 11	10 26	33 8	1 10	15 2	1 38	14 9	2 11	10 4	2 38	10 1	34.2
S.	20	10 48	32 6	11 12	31 5	2 7	14 3	2 36	13 10	3 6	9 10	3 35	9 7	35.2
M.	21	11 38	30 6	—	—	3 8	13 5	3 41	13 2	4 7	9 4	4 39	9 2	36.2
Tu.	22	0 8	29 9	0 39	29 4	4 17	12 11	4 53	12 10	5 12	9 0	5 44	9 0	37.2
W.	23	1 11	29 2	1 47	29 3	5 26	12 11	5 57	13 0	6 14	9 0	6 44	9 1	38.2
Th.	24	2 21	29 6	2 54	29 11	6 27	13 2	6 54	13 4	7 14	9 3	7 42	9 4	39.2
F.	25	3 26	30 5	3 56	31 0	7 21	13 6	7 45	13 9	8 10	9 6	8 37	9 7	40.2
S.	26	4 24	31 7	4 50	32 3	8 7	13 11	8 27	14 2	9 1	9 9	9 24	9 10	41.2
S.	27	5 15	32 11	5 38	33 5	8 46	14 5	9 5	14 7	9 46	10 0	10 5	10 1	42.2
M.	28	5 58	33 10	6 19	34 3	9 23	14 9	9 41	14 10	10 21	10 2	10 38	10 3	43.2
Tu.	29	6 39	34 5	6 58	34 7	9 59	14 11	10 16	15 0	10 55	10 4	11 13	10 5	44.2
W.	30	7 16	34 9	7 33	34 11	10 32	15 0	10 46	15 0	11 30	10 5	11 46	10 5	45.2
Th.	31	7 49	34 10	8 5	34 9	11 1	14 11	11 17	14 10	—	—	0 3	10 4	46.2
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
3 45		17	3 51		25	3 22	
3 48		18	3 49		26	3 16	
3 50		19	3 47		27	3 9	
3 52		20	3 44		28	3 3	
3 53		21	3 41		29	2 55	
3 53		22	3 37		30	2 48	
3 53		23	3 32		31	2 39	
3 52		24	3 27				

for Mean Time at Place; if Greenwich or Railway Time be required,—for
 HOLYHEAD add 18 m. KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.															
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.												
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.											
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.												
Tu.	1	om 50	11 29	9 2	11 43	9 2	8 41	7 4	8 55	7 3	5 59	10 9	6 13	10 7																
W.	2	1 37	11 59	9 1	—	—	9 10	7 1	9 25	7 0	6 29	10 6	6 46	10 4																
Th.	3	2 24	0 17	9 1	0 35	9 0	9 41	6 10	9 56	6 9	7 4	10 1	7 21	9 10																
F.	4	3 12	0 53	8 11	1 11	8 10	10 14	6 7	10 33	6 5	7 38	9 7	7 56	9 4																
S.	5	4 1	1 33	8 9	1 57	8 8	10 55	6 3	11 23	6 0	8 18	9 1	8 41	8 10																
S.	6	4 50	2 22	8 6	2 47	8 5	11 53	5 9	—	—	9 8	8 8	9 38	8 6																
M.	7	5 39	3 14	8 3	3 45	8 2	0 28	5 7	1 6	5 6	10 12	8 4	10 47	8 4																
Tu.	8	6 28	4 17	8 2	4 53	8 2	1 47	5 7	2 29	5 8	11 25	8 4	—	—																
W.	9	7 18	5 28	8 2	6 2	8 2	3 5	5 10	3 38	6 1	0 1	8 6	0 35	8 8																
Th.	10	8 9	6 35	8 3	7 8	8 4	4 7	6 5	4 32	6 8	1 9	8 11	1 41	9 2																
F.	11	9 1	7 36	8 6	8 3	8 9	4 54	6 11	5 17	7 1	2 8	9 7	2 34	10 0																
S.	12	9 56	8 28	9 1	8 53	9 3	5 39	7 4	6 3	7 7	2 59	10 4	3 21	10 9																
S.	13	10 53	9 17	9 6	9 42	9 8	6 28	7 10	6 53	8 0	3 44	11 2	4 8	11 6																
M.	14	11 52	10 7	9 9	10 31	9 10	7 20	8 2	7 45	8 3	4 33	11 9	4 59	11 11																
Tu.	15	om 53	10 54	9 11	11 16	9 10	8 8	8 4	8 30	8 4	5 23	12 1	5 46	12 1																
W.	16	1 55	11 39	9 9	—	—	8 51	8 2	9 13	8 0	6 9	11 11	6 33	11 8																
Th.	17	2 55	0 3	9 8	0 28	9 7	9 35	7 10	9 58	7 7	6 57	11 5	7 22	11 0																
F.	18	3 53	0 54	9 6	1 21	9 4	10 23	7 4	10 49	7 0	7 47	10 7	8 12	10 2																
S.	19	4 47	1 50	9 2	2 19	9 0	11 19	6 9	11 54	6 5	8 39	9 10	9 10	9 5																
S.	20	5 37	2 49	8 9	3 18	8 7	—	—	0 31	6 1	9 42	9 1	10 15	8 10																
M.	21	6 24	3 50	8 5	4 21	8 4	1 10	5 11	1 49	5 10	10 50	8 8	11 25	8 7																
Tu.	22	7 10	4 53	8 3	5 26	8 2	2 29	5 9	3 3	5 10	11 59	8 7	—	—																
W.	23	7 53	5 56	8 2	6 28	8 1	3 33	6 0	4 1	6 2	0 31	8 7	1 2	8 7																
Th.	24	8 36	7 0	8 2	7 28	8 3	4 26	6 3	4 49	6 4	1 33	8 8	2 1	8 10																
F.	25	9 20	7 55	8 4	8 19	8 5	5 11	6 6	5 31	6 7	2 28	9 0	2 50	9 3																
S.	26	10 3	8 40	8 7	9 1	8 9	5 51	6 8	6 11	6 9	3 11	9 5	3 30	9 8																
S.	27	10 48	9 21	8 10	9 41	8 11	6 32	6 10	6 52	6 11	3 48	9 10	4 7	10 0																
M.	28	11 34	9 59	9 0	10 17	9 1	7 11	7 0	7 30	7 1	4 25	10 2	4 43	10 4																
Tu.	29	morn.	10 34	9 1	10 52	9 1	7 49	7 1	8 6	7 2	5 2	10 5	5 21	10 6																
W.	30	0 21	11 9	9 1	11 24	9 1	8 22	7 2	8 37	7 2	5 39	10 6	5 54	10 6																
Th.	31	1 9	11 39	9 0	11 55	9 0	8 51	7 1	9 6	7 0	6 9	10 5	6 25	10 4																
Half Mean Spring } Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.															
Phases of the Moon.															Moon's Declination at Noon.															
D. H. M.															M.D. ° '				M.D. ° '				M.D. ° '				M.D. ° '			
Last Quarter - 7 9 42 Afternoon.															1 16 8. 6				9 5 8. 48				17 18 N. 9				25 7 S. 1			
New - - - - - 14 2 58 Afternoon.															2 17 35				10 1 30				18 16 48				26 10 21			
First Quarter 21 9 58 Morning.															3 18 19				11 3 N. 2				19 14 30				27 13 15			
Full - - - - - 29 1 18 Afternoon.															4 18 13				12 7 30				20 11 29				28 15 37			
															5 17 17				13 11 35				21 8 0				29 17 20			
In Perigee - - 14 9 0 Morning.															6 15 31				14 14 57				22 4 15				30 18 18			
In Apogee - - 27 1 0 Afternoon.															7 12 57				15 17 16				23 0 24				18 26			
															8 9 40				16 18 21				24 3 8. 24							

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

MAY, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
Tu.	1	5 18 14 1	5 34 14 0	5 45 11 3	6 1 11 3	6 5 11 11	6 21 11 11	6 21 11 11	16.2					
W.	2	5 50 13 10	6 7 13 8	6 17 11 2	6 33 11 1	6 38 11 10	6 55 11 9	17.2						
Th.	3	6 24 13 6	6 41 13 3	6 50 10 11	7 6 10 9	7 11 11 8	7 27 11 7	18.2						
F.	4	7 0 13 0	7 19 12 8	7 24 10 7	7 43 10 5	7 44 11 5	8 2 11 4	19.2						
S.	5	7 42 12 4	8 5 12 0	8 2 10 2	8 21 10 0	8 20 11 2	8 39 10 11	20.2						
S.	6	8 29 11 7	8 55 11 3	8 43 9 9	9 6 9 7	8 59 10 9	9 20 10 6	21.2						
M.	7	9 24 11 0	9 56 10 11	9 31 9 5	9 59 9 3	9 47 10 4	10 19 10 2	(
Tu.	8	10 33 10 11	11 10 11 1	10 32 9 3	11 8 9 3	10 54 10 1	11 28 10 1	23.2						
W.	9	11 47 11 4	— —	11 44 9 4	— —	12 0 10 2	— —	24.2						
Th.	10	0 21 11 8	0 53 12 2	0 19 9 7	0 54 9 10	0 32 10 4	1 4 10 7	25.2						
F.	11	1 20 12 8	1 46 13 3	1 27 10 2	2 0 10 6	1 36 11 0	2 9 11 4	26.2						
S.	12	2 13 13 9	2 39 14 2	2 28 10 11	2 56 11 3	2 42 11 9	3 12 12 1	27.2						
S.	13	3 4 14 8	3 28 15 1	3 23 11 7	3 50 11 11	3 41 12 5	4 10 12 9	28.2						
M.	14	3 53 15 6	4 18 15 9	4 16 12 2	4 42 12 5	4 39 12 11	5 5 13 1	●						
Tu.	15	4 42 16 0	5 6 16 0	5 8 12 7	5 33 12 7	5 29 13 2	5 53 13 3	0.9						
W.	16	5 30 15 11	5 54 15 8	5 57 12 6	6 20 12 4	6 17 13 2	6 41 13 1	1.9						
Th.	17	6 18 15 4	6 43 14 11	6 44 12 2	7 8 11 11	7 5 12 11	7 29 12 8	2.9						
F.	18	7 9 14 6	7 36 14 0	7 33 11 7	7 58 11 3	7 53 12 5	8 17 12 2	3.9						
S.	19	8 3 13 5	8 31 12 10	8 22 10 11	8 47 10 7	8 40 11 10	9 4 11 6	4.9						
S.	20	9 0 12 3	9 29 11 9	9 12 10 2	9 37 9 11	9 27 11 2	9 53 10 10	5.9						
M.	21	10 0 11 5	10 33 11 2	10 3 9 8	10 31 9 5	10 23 10 7	10 54 10 3)						
Tu.	22	11 8 11 2	11 42 11 2	11 6 9 4	11 39 9 3	11 25 10 1	11 55 10 0	7.9						
W.	23	— —	0 14 11 3	— —	0 12 9 3	— —	0 25 10 1	8.9						
Th.	24	0 45 11 5	1 12 11 7	0 45 9 4	1 17 9 6	0 56 10 2	1 26 10 3	9.2						
F.	25	1 39 11 10	2 2 12 1	1 48 9 8	2 16 9 10	1 57 10 5	2 26 10 8	10.9						
S.	26	2 25 12 4	2 47 12 7	2 40 10 0	3 4 10 2	2 54 10 10	3 19 11 0	11.9						
S.	27	3 8 12 9	3 27 13 0	3 26 10 4	3 47 10 6	3 44 11 2	4 7 11 4	12.9						
M.	28	3 45 13 2	4 3 13 4	4 7 10 8	4 26 10 10	4 28 11 5	4 49 11 6	13.9						
Tu.	29	4 21 13 6	4 39 13 8	4 45 10 11	5 4 10 11	5 8 11 7	5 26 11 7	○						
W.	30	4 56 13 9	5 13 13 9	5 22 11 0	5 40 11 0	5 43 11 8	6 0 11 8	15.9						
Th.	31	5 30 13 9	5 47 13 7	5 57 11 0	6 14 11 0	6 17 11 8	6 34 11 8	16.9						

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	3 2		9	3 45		17	3 51		25	3 22	
2	3 9		10	3 48		18	3 49		26	3 16	
3	3 16		11	3 50		19	3 47		27	3 9	
4	3 23		12	3 52		20	3 44		28	3 3	
5	3 28		13	3 53		21	3 41		29	2 55	
6	3 33		14	3 53		22	3 37		30	2 48	
7	3 38		15	3 53		23	3 32		31	2 39	
8	3 42		16	3 52		24	3 27				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

JUNE, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
F.	1	1m58	5	12	17	4	5	29	17	3	7	3	14	4	7	18	14	9	0	55	11	10	1	13	11	9
S.	2	2 47	5	48	17	1	6	7	16	11	7	35	14	1	7	55	14	5	1	31	11	8	1	49	11	8
S.	3	3 36	6	28	16	7	6	49	16	3	8	13	13	8	8	31	14	0	2	8	11	7	2	29	11	6
M.	4	4 25	7	13	16	0	7	38	15	7	8	49	13	2	9	11	13	6	2	50	11	4	3	13	11	3
Tu.	5	5 13	8	3	15	3	8	31	15	0	9	35	12	9	10	0	13	1	3	37	11	2	4	1	11	0
W.	6	6 2	9	0	14	10	9	31	14	10	10	28	12	5	10	59	12	11	4	28	10	10	4	56	10	9
Th.	7	6 52	10	6	15	0	10	41	15	2	11	33	12	5	—	—	—	—	5	25	10	8	5	58	10	8
F.	8	7 44	11	16	15	6	11	51	15	11	0	13	13	0	0	53	12	11	6	31	10	8	7	5	10	11
S.	9	8 38	—	—	—	—	0	22	16	5	1	31	13	8	2	9	13	9	7	38	11	2	8	11	11	6
S.	10	9 34	0	53	17	0	1	24	17	8	2	42	14	3	3	14	14	7	8	44	11	10	9	16	12	2
M.	11	10 34	1	51	18	4	2	17	18	11	3	43	14	11	4	11	15	3	9	46	12	5	10	13	12	8
Tu.	12	11 35	2	43	19	5	3	10	19	10	4	39	15	6	5	7	15	10	10	40	12	10	11	7	13	0
W.	13	0a36	3	37	20	0	4	3	20	0	5	33	15	11	5	58	16	3	11	33	13	1	11	59	13	2
Th.	14	1 36	4	28	19	11	4	51	19	9	6	24	16	0	6	48	16	4	—	—	—	—	0	25	13	1
F.	15	2 34	5	14	19	6	5	37	19	2	7	9	15	10	7	30	16	1	0	50	12	11	1	14	12	10
S.	16	3 27	6	0	18	9	6	23	18	4	7	52	15	4	8	14	15	7	1	38	12	8	2	1	12	6
S.	17	4 18	6	46	17	8	7	9	17	1	8	36	14	8	8	55	14	9	2	24	12	3	2	47	12	0
M.	18	5 5	7	34	16	5	7	59	15	10	9	14	13	9	9	35	13	11	3	10	11	9	3	34	11	6
Tu.	19	5 50	8	24	15	2	8	49	14	9	9	57	12	11	10	20	13	0	3	58	11	3	4	22	10	11
W.	20	6 34	9	14	14	4	9	44	14	1	10	45	12	3	11	12	12	5	4	45	10	8	5	9	10	5
Th.	21	7 17	10	17	14	4	10	50	13	11	11	41	11	11	—	—	—	—	5	38	10	3	6	8	10	2
F.	22	8 1	11	23	14	0	11	56	14	2	0	18	12	3	0	53	12	2	6	39	10	0	7	11	10	2
S.	23	8 45	—	—	—	—	0	27	14	4	1	28	12	5	2	1	12	6	7	43	10	3	8	16	10	5
S.	24	9 30	0	56	14	7	1	23	14	11	2	32	12	9	3	1	13	0	8	47	10	8	9	14	10	10
M.	25	10 17	1	46	15	4	2	8	15	10	3	29	13	3	3	53	13	7	9	39	11	0	10	2	11	2
Tu.	26	11 5	2	28	16	3	2	47	16	7	4	16	13	8	4	38	14	2	10	23	11	4	10	43	11	6
W.	27	11 54	3	7	17	0	3	26	17	3	4	59	14	1	5	19	14	7	11	3	11	8	11	22	11	9
Th.	28	morn.	3	44	17	5	4	3	17	7	5	38	14	5	5	57	14	11	11	40	11	10	11	59	11	11
F.	29	0 44	4	21	17	9	4	40	17	10	6	15	14	7	6	33	15	2	—	—	—	—	0	19	11	11
S.	30	1 34	4	57	17	10	5	15	17	10	6	50	14	8	7	7	15	2	0	38	12	0	0	57	12	0
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
Last Quarter - 6 7 13 Morning.												1 17 S. 44 9 9 N. 54 17 9 N. 26 25 16 S. 52														
New - - - - - 12 10 7 Afternoon.												2 16 10 10 13 34 18 5 40 26 18 6														
First Quarter 19 11 45 Afternoon.												3 13 50 11 16 22 19 1 46 27 18 30														
Full - - - - - 28 3 35 Morning.												4 10 46 12 18 3 20 28. 8 28 18 4														
In Perigee - - 11 5. 0 Afternoon.												5 7 8 13 18 29 21 5 52 29 16 45														
In Apogee - - 23 12 0 Midnight.												6 3 2 14 17 38 22 9 19 30 14 36														
												7 1 N. 19 15 15 41 23 12 22														
												8 5 44 16 12 51 24 14 56														

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

JUNE, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.	
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
F.	1	1m58	1	22	9	3	1	39	9	3	0	32	24	3	0	49	24	1	7	38	19	3	7	56	19	1
S.	2	2 47	1	56	9	3	2	14	9	3	1	6	23	11	1	24	23	8	8	16	19	0	8	35	18	10
S.	3	3 36	2	34	9	2	2	54	9	1	1	43	23	5	2	4	23	1	8	55	18	6	9	16	18	3
M.	4	4 25	3	14	9	0	3	37	9	0	2	25	22	9	2	47	22	6	9	38	18	0	10	0	17	9
Tu.	5	5 13	4	0	8	11	4	25	8	10	3	11	22	2	3	36	21	9	10	22	17	5	10	46	17	1
W.	6	6 2	4	52	8	9	5	21	8	9	4	5	21	6	4	36	21	3	11	11	16	10	11	37	16	9
Th.	7	6 52	5	52	8	8	6	25	8	8	5	9	21	3	5	48	21	5	—	—	—	—	0	7	16	9
F.	8	7 44	6	57	8	7	7	30	8	9	6	25	21	9	7	0	22	3	0	38	16	11	1	15	17	3
S.	9	8 38	8	3	8	11	8	34	9	1	7	32	22	9	8	2	23	5	1	52	17	8	2	27	18	3
S.	10	9 34	9	6	9	3	9	37	9	5	8	31	24	1	9	0	24	9	3	1	18	11	3	35	19	7
M.	11	10 34	10	6	9	7	10	34	9	8	9	26	25	5	9	52	25	11	4	6	20	2	4	36	20	9
Tu.	12	11 35	11	3	9	9	11	32	9	10	10	18	26	4	10	46	26	8	5	7	21	3	5	37	21	7
W.	13	0a36	12	0	9	11	—	—	—	—	11	12	26	11	11	38	27	0	6	4	21	9	6	30	21	11
Th.	14	1 36	0	26	10	0	0	52	10	0	—	—	—	—	0	3	26	11	6	55	21	10	7	18	21	9
F.	15	2 34	1	17	10	0	1	40	9	11	0	27	26	10	0	50	26	6	7	40	21	5	8	4	21	1
S.	16	3 27	2	3	9	10	2	26	9	9	1	13	26	1	1	36	25	6	8	28	20	8	8	51	20	2
S.	17	4 18	2	49	9	7	3	11	9	5	1	59	24	11	2	22	24	4	9	14	19	8	9	36	19	1
M.	18	5 5	3	34	9	4	3	57	9	2	2	45	23	8	3	8	23	0	9	57	18	6	10	20	17	11
Tu.	19	5 50	4	21	9	0	4	46	8	10	3	32	22	5	3	58	21	9	10	43	17	4	11	3	16	9
W.	20	6 34	5	10	8	8	5	35	8	7	4	25	21	3	4	53	20	9	11	23	16	3	11	48	15	11
Th.	21	7 17	6	4	8	5	6	34	8	4	5	24	20	5	5	59	20	4	—	—	—	—	0	16	15	9
F.	22	8 1	7	5	8	3	7	37	8	3	6	34	20	4	7	7	20	6	0	46	15	8	1	22	15	8
S.	23	8 45	8	8	8	4	8	39	8	5	7	37	20	9	8	7	21	1	1	57	15	10	2	31	16	2
S.	24	9 30	9	9	8	6	9	36	8	7	8	35	21	4	9	0	21	9	3	3	16	5	3	31	16	11
M.	25	10 17	10	0	8	8	10	23	8	9	9	22	22	2	9	43	22	7	3	57	17	3	4	22	17	8
Tu.	26	11 5	10	44	8	10	11	6	8	11	10	2	22	11	10	21	23	3	4	47	18	1	5	8	18	5
W.	27	11 54	11	28	9	0	11	48	9	1	10	41	23	7	11	0	23	10	5	31	18	9	5	52	19	0
Th.	28	morn.	—	—	—	—	0	8	9	2	11	19	24	0	11	38	24	3	6	12	19	3	6	30	19	6
F.	29	0 44	0	27	9	3	0	46	9	3	11	57	24	5	—	—	—	—	6	49	19	8	7	6	19	9
S.	30	1 34	1	5	9	4	1	24	9	4	0	16	24	7	0	34	24	8	7	24	19	9	7	42	19	9
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.								10ft. 6in.											

Phases of the Moon.

Moon's Declination at Noon.

D. H. M.				M.D.				M.D.				M.D.				M.D.			
Last Quarter-	6	7	13	Morning.	1	17	S.44	9	9	N.54	17	9	N.26	25	16	S.52			
New - - - - -	12	10	7	Afternoon.	2	16	10	10	13	34	18	5	40	26	18	6			
First Quarter	19	11	45	Afternoon.	3	13	50	11	16	22	19	1	46	27	18	30			
Full - - - - -	23	3	35	Morning.	4	10	46	12	18	3	20	2	S.8	28	18	4			
					5	7	8	13	18	29	21	5	52	29	16	45			
In Perigee - -	11	5	0	Afternoon.	6	3	2	14	17	38	22	9	19	30	14	36			
In Apogee - -	23	12	0	Midnight.	7	1	N.19	15	15	41	23	12	22						
					8	5	44	16	12	51	24	14	56						

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 26 m.

JUNE, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
F. S.	1	8	21	34	7	8	38	34	6	11	35	14	9	11	54	14	8	0	20	10	3	0	38	10	2	17.9
	2	8	56	34	4	9	14	34	2	—	—	—	—	0	14	14	6	0	57	10	1	1	15	10	0	18.9
S. M.	3	9	32	33	8	9	51	33	2	0	36	14	5	0	58	14	2	1	36	9	11	1	58	9	9	19.9
Tu.	4	10	10	32	9	10	29	32	3	1	22	14	0	1	47	13	10	2	22	9	8	2	46	9	7	20.9
W.	5	10	50	31	8	11	14	31	2	2	13	13	8	2	40	13	6	3	11	9	6	3	38	9	5	21.9
Th.	6	11	41	30	10	—	—	—	—	3	10	13	4	3	44	13	3	4	9	9	4	4	42	9	3	22.9
F. S.	7	0	11	30	8	0	43	30	8	4	18	13	3	4	56	13	5	5	15	9	3	5	48	9	3	23.9
	8	1	16	30	11	1	50	31	5	5	29	13	8	6	1	13	11	6	18	9	5	6	48	9	7	24.9
S. M.	9	2	25	32	1	3	0	32	11	6	31	14	3	6	59	14	7	7	17	9	10	7	46	10	0	25.9
Tu.	10	3	37	33	9	4	13	34	9	7	27	14	11	7	55	15	3	8	18	10	3	8	50	10	5	26.9
W.	11	4	47	35	10	5	17	36	9	8	22	15	8	8	47	16	0	9	20	10	8	9	46	10	10	27.9
Th.	12	5	48	37	6	6	19	38	1	9	12	16	3	9	39	16	6	10	12	11	0	10	37	11	2	28.9
F. S.	13	6	46	38	4	7	13	38	8	10	5	16	7	10	28	16	8	11	2	11	3	11	26	11	4	0.6
	14	7	38	38	8	8	1	38	5	10	50	16	7	11	12	16	5	11	51	11	3	—	—	—	—	1.6
S. M.	15	8	23	38	1	8	45	37	7	11	36	16	3	—	—	—	0	15	11	2	0	39	11	0	—	2.6
Tu.	16	9	8	37	1	9	29	36	4	0	1	16	0	0	26	15	8	1	4	10	10	1	29	10	8	3.6
W.	17	9	49	35	5	10	8	34	6	0	52	15	4	1	17	14	11	1	53	10	5	2	17	10	2	4.6
Th.	18	10	27	33	6	10	48	32	7	1	42	14	7	2	8	14	2	2	41	10	0	3	7	9	10	5.6
F. S.	19	11	9	31	7	11	30	30	8	2	35	13	10	3	3	13	6	3	34	9	7	4	0	9	5	6.6
	20	11	54	30	0	—	—	—	—	3	31	13	2	4	0	13	0	4	26	9	3	4	58	9	1	7.6
S. M.	21	0	23	29	4	0	53	29	0	4	33	12	10	5	7	12	9	5	28	8	11	5	57	8	11	8.6
Tu.	22	1	25	28	10	1	57	29	0	5	38	12	9	6	8	12	11	6	26	9	0	6	55	9	1	9.6
W.	23	2	30	29	2	3	4	29	6	6	36	13	0	7	4	13	2	7	23	9	2	7	52	9	3	10.6
Th.	24	3	37	29	11	4	8	30	5	7	31	13	3	7	56	13	6	8	21	9	4	8	48	9	5	11.6
F. S.	25	4	36	31	1	5	2	31	9	8	18	13	9	8	39	13	11	9	12	9	7	9	35	9	9	12.6
	26	5	27	32	5	5	50	33	0	8	57	14	2	9	16	14	4	9	57	9	10	10	16	10	0	13.6
S. M.	27	6	13	33	6	6	34	33	11	9	35	14	7	9	54	14	9	10	34	10	2	10	51	10	3	14.6
Tu.	28	6	54	34	3	7	13	34	8	10	12	14	10	10	29	14	11	11	9	10	4	11	27	10	5	15.6
W.	29	7	32	35	0	7	50	35	3	10	46	15	0	11	2	15	1	11	45	10	5	—	—	—	—	16.6
Th.	30	8	8	35	4	8	25	35	5	11	19	15	1	11	38	15	1	0	4	10	5	0	22	10	5	17.6
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	2	31	Add.	9	1	8	Add.	17	0	32	Sub.	25	2	15	Sub.
2	2	22		10	0	56		18	0	45		26	2	27	
3	2	12		11	0	44		19	0	58		27	2	40	
4	2	2		12	0	32		20	1	11		28	2	52	
5	1	52		13	0	19		21	1	23		29	3	4	
6	1	42		14	0	7		22	1	36		30	3	16	
7	1	31		15	0	6	Sub.	23	1	49					
8	1	19		16	0	19		24	2	2					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JUNE, 1866.

JUNE, 1866.																																	
WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.																		
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.															
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.														
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.															
F.	1	1m58	—	—		0 14	9 0	9 22	6 11	9 39	6 10	6 43	10 2	7 2	10 0																		
S.	2	2 47	0 33	9 0	0 53	8 11	9 57	6 9	10 16	6 8	7 21	9 10	7 40	9 8																			
S.	3	3 36	1 14	8 11	1 37	8 10	10 37	6 6	11 0	6 4	8 0	9 6	8 23	9 4																			
M.	4	4 25	2 2	8 9	2 28	8 8	11 30	6 3	12 0	6 1	8 48	9 2	9 14	9 0																			
Tu.	5	5 13	2 54	8 7	3 22	8 6	—	—	0 35	5 11	9 45	8 11	10 18	8 10																			
W.	6	6 2	3 52	8 5	4 23	8 5	1 12	5 10	1 51	5 11	10 52	8 9	11 27	8 10																			
Th.	7	6 52	4 56	8 4	5 29	8 5	2 30	6 0	3 7	6 2	—	—	0 3	8 11																			
F.	8	7 44	5 59	8 5	6 32	8 5	3 37	6 5	4 4	6 8	0 34	9 1	1 6	9 3																			
S.	9	8 38	7 4	8 6	7 33	8 8	4 29	6 10	4 52	7 1	1 37	9 6	2 5	9 9																			
S.	10	9 34	8 1	8 10	8 29	9 1	5 15	7 3	5 40	7 4	2 33	10 1	3 0	10 5																			
M.	11	10 34	8 56	9 3	9 22	9 5	6 6	7 6	6 33	7 9	3 25	10 9	3 49	11 0																			
Tu.	12	11 35	9 48	9 7	10 15	9 8	7 0	7 10	7 29	7 11	4 14	11 4	4 42	11 6																			
W.	13	0a36	10 41	9 8	11 5	9 8	7 55	8 0	8 18	8 1	5 9	11 8	5 35	11 9																			
Th.	14	1 36	11 28	9 8	11 50	9 7	8 41	8 0	9 3	7 11	5 59	11 8	6 21	11 6																			
F.	15	2 34	—	—		0 15	9 6	9 24	7 9	9 46	7 6	6 45	11 3	7 9	11 0																		
S.	16	3 27	0 40	9 5	1 5	9 4	10 9	7 4	10 32	7 2	7 33	10 8	7 56	10 4																			
S.	17	4 18	1 30	9 3	1 56	9 1	10 55	6 11	11 22	6 8	8 18	10 0	8 42	9 8																			
M.	18	5 5	2 22	8 11	2 49	8 9	11 54	6 5	—	—	9 9	9 5	9 39	9 2																			
Tu.	19	5 50	3 17	8 7	3 45	8 6	0 26	6 1	1 1	5 11	10 10	8 11	10 40	8 9																			
W.	20	6 34	4 12	8 4	4 39	8 3	1 35	5 10	2 10	5 9	11 10	8 7	11 41	8 6																			
Th.	21	7 17	5 9	8 2	5 38	8 1	2 45	5 9	3 16	5 10	—	—	0 11	8 5																			
F.	22	8 1	6 7	8 1	6 38	8 1	3 44	5 11	4 11	6 1	0 41	8 5	1 12	8 6																			
S.	23	8 45	7 8	8 1	7 39	8 2	4 36	6 2	4 59	6 3	1 41	8 7	2 11	8 9																			
S.	24	9 30	8 6	8 3	8 30	8 4	5 21	6 4	5 42	6 5	2 38	8 11	3 1	9 1																			
M.	25	10 17	8 52	8 6	9 13	8 8	6 2	6 6	6 23	6 7	3 22	9 3	3 41	9 6																			
Tu.	26	11 5	9 32	8 9	9 52	8 10	6 43	6 9	7 4	6 10	3 59	9 8	4 18	9 11																			
W.	27	11 54	10 12	8 11	10 30	9 0	7 25	6 11	7 44	7 0	4 38	10 1	4 57	10 3																			
Th.	28	morn.	10 48	9 1	11 6	9 1	8 2	7 1	8 19	7 2	5 16	10 5	5 35	10 6																			
F.	29	0 44	11 24	9 1	11 40	9 1	8 36	7 3	8 52	7 3	5 53	10 7	6 10	10 7																			
S.	30	1 34	11 57	9 1	—	—	9 9	7 2	9 26	7 1	6 27	10 7	6 46	10 6																			
Half Mean Spring } Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.																		
Phases of the Moon.																	Moon's Declination at Noon.																
D. H. M.																	M.D. ° '																
Last Quarter - 6 7 13 Morning.																	1 17 S. 44 9 9 N. 54 17 9 N. 26 25 16 S. 52																
New - - - - - 12 10 7 Afternoon.																	2 16 10 10 13 34 18 5 40 26 18 6																
First Quarter- 19 11 45 Afternoon.																	3 13 50 11 16 22 19 1 46 27 18 30																
Full - - - - - 28 3 35 Morning.																	4 10 46 12 18 3 20 2 S. 8 28 18 4																
																	5 7 8 13 18 29 21 5 52 29 16 45																
In Perigee - - 11 5 0 Afternoon.																	6 3 2 14 17 38 22 9 19 30 14 36																
In Apogee - - 23 12 0 Midnight.																	7 1 N. 19 15 15 41 23 12 22																
																	8 5 44 16 12 51 24 14 56																

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2. m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

JUNE, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.									
F.	1	6	4	13	6	6	22	13	5	6	30	10	11	6	48	10	10	6	52	11	8	7	9	11	7	17.9	
S.	2	6	42	13	3	7	2	13	1	7	7	10	9	7	26	10	8	7	28	11	7	7	47	11	6	18.9	
S.	3	7	23	12	11	7	47	12	8	7	47	10	6	8	7	10	4	8	6	11	5	8	25	11	4	19.9	
M.	4	8	12	12	5	8	37	12	2	8	28	10	3	8	50	10	1	8	46	11	3	9	7	11	1	20.9	
Tu.	5	9	3	11	10	9	31	11	8	9	14	9	11	9	39	9	10	9	29	10	11	9	55	10	10	21.9	
W.	6	10	2	11	7	10	35	11	7	10	5	9	9	10	35	9	8	10	25	10	8	10	57	10	7	22.9	
Th.	7	11	11	11	9	11	45	11	11	11	9	9	9	11	42	9	10	11	29	10	6	11	59	10	6	23.9	
F.	8	—	—	—	—	0	18	12	3	—	—	—	—	0	16	10	0	—	—	—	—	0	29	10	8	24.9	
S.	9	0	49	12	7	1	16	13	0	0	49	10	2	1	23	10	5	1	0	10	11	1	31	11	2	25.9	
S.	10	1	44	13	5	2	14	13	9	1	57	10	8	2	29	11	0	2	7	11	6	2	43	11	9	26.9	
M.	11	2	42	14	2	3	8	14	7	3	0	11	3	3	29	11	7	3	16	12	1	3	46	12	4	27.9	
Tu.	12	3	34	14	11	4	1	15	2	3	57	11	10	4	25	12	0	4	17	12	7	4	48	12	9	28.9	
W.	13	4	28	15	4	4	53	15	6	4	52	12	2	5	19	12	3	5	15	12	9	5	40	12	10	29.9	
Th.	14	5	18	15	6	5	42	15	4	5	45	12	2	6	9	12	1	6	5	12	10	6	29	12	9	30.9	
F.	15	6	6	15	2	6	30	14	10	6	32	12	0	6	55	11	10	6	53	12	8	7	16	12	7	31.9	
S.	16	6	54	14	6	7	18	14	1	7	19	11	7	7	42	11	4	7	39	12	5	8	2	12	3	32.9	
S.	17	7	42	13	9	8	6	13	3	8	4	11	0	8	25	10	9	8	23	12	0	8	44	11	9	33.9	
M.	18	8	32	12	9	8	59	12	3	8	47	10	5	9	11	10	2	9	4	11	6	9	26	11	2	34.9	
Tu.	19	9	25	11	10	9	50	11	6	9	34	9	11	9	56	9	8	9	49	10	11	10	14	10	8	35.9	
W.	20	10	18	11	3	10	49	11	1	10	19	9	5	10	48	9	3	10	41	10	4	11	10	10	2	36.9	
Th.	21	11	21	11	0	11	53	11	0	11	19	9	3	11	51	9	2	11	38	10	0	—	—	—	—	3	37.9
F.	22	—	—	—	—	0	25	11	1	—	—	—	—	0	23	9	3	0	6	9	10	0	35	9	11	4	38.9
S.	23	0	53	11	3	1	22	11	5	0	55	9	4	1	28	9	5	1	4	10	0	1	36	10	1	39.9	
S.	24	1	49	11	7	2	13	11	10	1	59	9	6	2	27	9	8	2	8	10	3	2	38	10	6	40.9	
M.	25	2	36	12	1	2	58	12	4	2	52	9	10	3	16	10	1	3	6	10	8	3	31	10	10	41.9	
Tu.	26	3	19	12	7	3	38	12	10	3	38	10	3	4	0	10	5	3	55	11	0	4	18	11	2	42.9	
W.	27	3	58	13	1	4	17	13	3	4	21	10	7	4	41	10	9	4	42	11	4	5	3	11	5	43.9	
Th.	28	4	35	13	6	4	53	13	8	5	0	10	11	5	19	11	0	5	22	11	6	5	40	11	7	44.9	
F.	29	5	12	13	9	5	30	13	10	5	38	11	1	5	57	11	2	5	59	11	9	6	18	11	10	45.9	
S.	30	5	49	13	11	6	8	13	11	6	16	11	2	6	34	11	2	6	36	11	10	6	55	11	11	46.9	
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.									

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	2	31		9	1	8		17	0	32		25	2	15	
2	2	22		10	0	56		18	0	45		26	2	27	
3	2	12		11	0	44		19	0	58		27	2	40	
4	2	2		12	0	32		20	1	11		28	2	52	
5	1	52		13	0	19		21	1	23		29	3	4	
6	1	42		14	0	7		22	1	36		30	3	16	
7	1	31		15	0	6		23	1	49					
8	1	19		16	0	19		24	2	2					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. **QUEENSTOWN** add 8 m. **WATERFORD** add 8 m.

D

TIDE TABLES FOR THE

JULY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
S.	1	2m 23	5	34	17	10	5	53	17	9	7	24	14	6	7	42	15	0	1	16	12	0	1	35	12	0
M.	2	3 12	6	12	17	8	6	33	17	5	8	1	14	3	8	21	14	8	1	54	12	0	2	14	11	11
Tu.	3	4 0	6	55	17	2	7	17	16	11	8	39	13	11	8	58	14	3	2	35	11	11	2	56	11	10
W.	4	4 49	7	41	16	6	8	6	16	2	9	19	13	7	9	42	13	10	3	18	11	8	3	41	11	7
Th.	5	5 39	8	34	15	9	9	4	15	5	10	8	13	3	10	35	13	5	4	4	11	5	4	31	11	3
F.	6	6 30	9	34	15	4	10	8	15	4	11	5	13	0	11	38	13	1	5	0	11	0	5	29	10	11
S.	7	7 24	10	45	15	4	11	22	15	6	—	—	—	—	0	17	13	0	6	1	10	10	6	35	10	9
S.	8	8 20	11	59	15	10	—	—	—	—	0	57	13	3	1	37	13	5	7	10	10	11	7	46	11	2
M.	9	9 19	0	33	16	3	1	6	16	9	2	15	13	8	2	50	14	0	8	22	11	5	8	57	11	9
Tu.	10	10 19	1	38	17	5	2	8	18	0	3	25	14	4	3	56	14	10	9	30	12	0	10	2	12	3
W.	11	11 19	2	36	18	7	3	2	19	1	4	26	15	0	4	54	15	7	10	32	12	6	10	58	12	8
Th.	12	0a 18	3	27	19	4	3	51	19	6	5	21	15	5	5	46	16	0	11	23	12	9	11	47	12	10
F.	13	1 14	4	16	19	7	4	39	19	7	6	11	15	8	6	35	16	3	—	—	—	—	0	12	12	11
S.	14	2 7	5	0	19	6	5	21	19	3	6	57	15	8	7	17	16	1	0	36	12	10	0	59	12	9
S.	15	2 56	5	41	18	11	6	2	18	8	7	36	15	4	7	55	15	8	1	21	12	8	1	43	12	7
M.	16	3 44	6	22	18	3	6	42	17	9	8	15	14	9	8	32	14	11	2	3	12	5	2	23	12	3
Tu.	17	4 29	7	2	17	2	7	24	16	7	8	48	14	1	9	4	14	2	2	43	12	0	3	3	11	10
W.	18	5 13	7	46	16	0	8	7	15	3	9	22	13	4	9	42	13	4	3	24	11	7	3	45	11	3
Th.	19	5 57	8	28	14	9	8	52	14	3	10	2	12	8	10	23	12	6	4	5	11	0	4	25	10	9
F.	20	6 41	9	19	13	10	9	50	13	7	10	47	12	1	11	13	11	10	4	48	10	5	5	14	10	2
S.	21	7 26	10	24	13	5	10	58	13	5	11	45	11	9	—	—	—	—	5	43	10	0	6	15	9	10
S.	22	8 12	11	33	13	6	—	—	—	—	0	21	11	9	0	58	11	10	6	48	9	9	7	22	9	11
M.	23	8 59	0	11	13	8	0	43	14	0	1	35	11	11	2	11	12	3	7	58	10	1	8	32	10	3
Tu.	24	9 48	1	12	14	5	1	39	14	11	2	44	12	5	3	15	13	1	9	3	10	6	9	31	10	9
W.	25	10 38	2	2	15	6	2	24	16	0	3	43	13	1	4	8	13	10	9	56	11	0	10	19	11	3
Th.	26	11 28	2	45	16	7	3	5	17	2	4	32	13	9	4	55	14	6	10	41	11	6	11	1	11	9
F.	27	morn.	3	24	17	7	3	43	17	11	5	16	14	3	5	37	15	1	11	20	11	11	11	39	12	1
S.	28	0 18	4	2	18	3	4	22	18	6	5	56	14	8	6	15	15	5	11	58	12	3	—	—	—	—
S.	29	1 8	4	40	18	8	4	57	18	10	6	35	15	0	6	54	15	8	0	18	12	4	0	37	12	5
M.	30	1 58	5	15	18	11	5	34	19	0	7	11	15	1	7	29	15	7	0	57	12	6	1	16	12	6
Tu.	31	2 47	5	53	18	10	6	14	18	9	7	48	15	0	8	8	15	4	1	35	12	7	1	54	12	7

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	5	2	3	Afternoon.
New - - - -	12	5	35	Morning.
First Quarter -	19	3	44	Afternoon.
Full - - - -	27	4	13	Afternoon.
In Perigee - -	9	7	0	Afternoon.
In Apogee - -	21	5	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	11	S. 43	9	17	N. 27	17	0	S. 36	25	18	S. 14
2	8	13	10	18	25	18	4	27	26	17	13
3	4	15	11	18	9	19	8	3	27	15	20
4	0	N. 0	12	16	42	20	11	16	28	12	39
5	4	20	13	14	14	21	14	1	29	9	16
6	8	30	14	11	1	22	16	11	30	5	23
7	12	16	15	7	19	23	17	40	31	1	10
8	15	20	16	3	23	24	18	22			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

JULY, 1866.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE at Noon.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.							
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.							
S.	1	0 51 17 9	1 12 17 10	2 29 15 4	2 46 15 4	3 57 18 5	4 16 18 6	18.6																		
M.	2	1 33 17 9	1 53 17 9	3 4 15 4	3 23 15 3	4 35 18 6	4 53 18 5	19.6																		
Tu.	3	2 15 17 7	2 37 17 5	3 43 15 2	4 4 15 1	5 13 18 4	5 36 18 3	20.6																		
W.	4	3 0 17 3	3 22 16 11	4 25 14 11	4 48 14 9	5 57 18 1	6 19 17 11	21.6																		
Th.	5	3 45 16 9	4 12 16 5	5 12 14 6	5 38 14 4	6 43 17 9	7 10 17 6	22.6																		
F.	6	4 39 16 1	5 6 15 10	6 8 14 2	6 40 14 0	7 37 17 1	8 8 17 1	23.6																		
S.	7	5 34 15 9	6 4 15 8	7 13 13 10	7 49 13 11	8 42 17 0	9 20 16 11	24.6																		
S.	8	6 36 15 11	7 12 16 3	8 27 14 0	9 2 14 3	9 53 16 10	10 28 17 0	25.6																		
M.	9	7 47 16 8	8 21 17 1	9 36 14 7	10 8 14 10	11 3 17 2	11 36 17 4	26.6																		
Tu.	10	8 54 17 6	9 26 17 10	10 40 15 1	11 12 15 5	—	0 9 17 8	27.6																		
W.	11	9 57 18 1	10 25 18 7	11 41 15 8	—	0 40 18 0	1 9 18 4	28.6																		
Th.	12	10 52 18 10	11 19 19 0	0 9 15 11	0 35 16 2	1 36 18 1	2 2 18 11	29.6																		
F.	13	11 45 19 1	—	1 0 16 4	1 24 16 5	2 27 19 2	2 52 19 4	30.6																		
S.	14	0 10 19 1	0 33 19 0	1 48 16 5	2 10 16 4	3 17 19 6	3 41 19 6	31.6																		
S.	15	0 56 18 10	1 19 18 8	2 31 16 3	2 51 16 2	4 2 19 5	4 22 19 4	32.6																		
M.	16	1 42 18 6	2 3 18 3	3 11 16 0	3 32 15 9	4 43 19 2	5 3 18 11	33.6																		
Tu.	17	2 24 17 10	2 45 17 5	3 52 15 6	4 12 15 3	5 25 18 9	5 45 18 5	34.6																		
W.	18	3 6 17 0	3 26 16 6	4 33 14 11	4 55 14 7	6 6 18 1	6 27 17 9	35.6																		
Th.	19	3 45 16 0	4 6 15 7	5 16 14 3	5 38 13 11	6 48 17 4	7 10 17 0	36.6																		
F.	20	4 28 15 1	4 51 14 8	6 2 13 7	6 28 13 4	7 31 16 8	7 56 16 4	37.6																		
S.	21	5 18 14 5	5 46 14 2	6 58 13 0	7 31 12 11	8 26 16 1	9 2 15 11	38.6																		
S.	22	6 16 14 1	6 48 14 3	8 5 12 11	8 39 12 11	9 32 15 8	10 5 15 7	39.6																		
M.	23	7 24 14 6	7 58 14 9	9 12 13 1	9 47 13 4	10 39 15 8	11 13 15 9	40.6																		
Tu.	24	8 28 15 2	8 54 15 6	10 20 13 6	10 48 13 9	11 46 15 11	—	41.6																		
W.	25	9 19 15 11	9 42 16 1	11 13 14 1	11 36 14 4	0 16 16 2	0 42 16 5	42.6																		
Th.	26	10 5 16 8	10 27 17 1	11 57 14 7	—	1 4 16 9	1 26 17 1	43.6																		
F.	27	10 48 17 5	11 9 17 8	0 18 14 10	0 38 15 1	1 46 17 5	2 7 17 9	44.6																		
S.	28	11 31 18 0	11 51 18 2	0 57 15 4	1 16 15 6	2 25 18 1	2 45 18 4	45.6																		
S.	29	—	0 11 18 4	1 35 15 9	1 54 15 10	3 4 18 7	3 22 18 10	46.6																		
M.	30	0 31 18 6	0 51 18 8	2 11 15 11	2 29 15 11	3 40 19 0	3 58 19 1	47.6																		
Tu.	31	1 12 18 8	1 33 18 11	2 46 16 0	3 4 16 0	4 17 19 2	4 35 19 2	48.6																		
Half Mean Spring Range.		9ft. 4in.								8ft. 0in.								9ft. 7in.								

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 28	Sub.	9	4 51	Sub.	17	5 49	Sub.	25	6 13	Sub.
2	3 39		10	5 0		18	5 54		26	6 13	
3	3 50		11	5 8		19	5 58		27	6 13	
4	4 1		12	5 16		20	6 2		28	6 12	
5	4 12		13	5 24		21	6 5		29	6 10	
6	4 22		14	5 31		22	6 8		30	6 8	
7	4 32		15	5 37		23	6 10		31	6 6	
8	4 42		16	5 43		24	6 12				

To

are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
1 m. 1 SHEERNESS subtract 3 m. LONDON 0 m.

D 2

TIDE TABLES FOR THE

JULY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.													
S.	1	2m 23	1 43	11 0	2 1	11 0	8 20	19 10	8 39	19 10	5 10	13 7	5 29	13 6																	
M.	2	3 12	2 21	10 11	2 41	10 11	8 58	19 8	9 18	19 6	5 49	13 4	6 10	13 3																	
Tu.	3	4 0	3 1	10 10	3 22	10 9	9 40	19 3	10 1	19 1	6 32	13 1	6 55	12 11																	
W.	4	4 49	3 43	10 8	4 4	10 7	10 23	18 10	10 48	18 8	7 19	12 10	7 44	12 8																	
Th.	5	5 39	4 27	10 6	4 51	10 5	11 16	18 4	11 49	18 0	8 10	12 5	8 40	12 3																	
F.	6	6 30	5 20	10 4	5 50	10 3	—	—	0 25	17 9	9 12	12 1	9 45	12 0																	
S.	7	7 24	6 21	10 3	6 56	10 3	0 58	17 8	1 30	17 8	10 20	11 11	10 54	12 0																	
S.	8	8 20	7 35	10 4	8 10	10 6	2 2	17 9	2 33	18 0	11 26	12 2	11 57	12 5																	
M.	9	9 19	8 43	10 8	9 16	10 10	3 5	18 6	3 37	19 0	—	—	0 28	12 9																	
Tu.	10	10 19	9 49	11 0	10 21	11 3	4 9	19 6	4 40	19 11	0 59	13 1	1 31	13 6																	
W.	11	11 19	10 52	11 5	11 22	11 7	5 9	20 3	5 37	20 8	2 4	13 9	2 34	14 0																	
Th.	12	0 8 18	11 47	11 9	—	—	6 4	20 11	6 30	21 1	2 59	14 3	3 23	14 5																	
F.	13	1 14	0 12	11 10	0 36	11 10	6 55	21 3	7 19	21 4	3 47	14 7	4 11	14 9																	
S.	14	2 7	1 0	11 9	1 23	11 9	7 43	21 3	8 4	21 2	4 33	14 9	4 54	14 8																	
S.	15	2 56	1 45	11 8	2 6	11 6	8 25	21 0	8 46	20 9	5 14	14 5	5 36	14 2																	
M.	16	3 44	2 28	11 4	2 49	11 2	9 7	20 5	9 28	20 0	5 58	13 11	6 19	13 7																	
Tu.	17	4 29	3 10	11 0	3 30	10 10	9 48	19 7	10 8	19 1	6 40	13 3	7 3	12 11																	
W.	18	5 13	3 50	10 8	4 11	10 6	10 30	18 7	10 52	18 1	7 26	12 7	7 48	12 3																	
Th.	19	5 57	4 31	10 4	4 51	10 1	11 17	17 7	11 43	17 2	8 10	11 11	8 34	11 7																	
F.	20	6 41	5 14	9 11	5 38	9 10	—	—	0 13	16 9	9 0	11 4	9 29	11 1																	
S.	21	7 26	6 5	9 8	6 37	9 8	0 43	16 4	1 13	16 2	10 1	10 11	10 34	10 9																	
S.	22	8 12	7 13	9 7	7 48	9 8	1 43	16 0	2 14	16 0	11 6	10 9	11 38	10 10																	
M.	23	8 59	8 21	9 9	8 55	9 10	2 44	16 3	3 16	16 7	—	—	0 9	11 1																	
Tu.	24	9 48	9 27	10 0	9 55	10 2	3 48	17 0	4 17	17 5	0 39	11 4	1 7	11 7																	
W.	25	10 38	10 22	10 4	10 47	10 6	4 42	17 10	5 4	18 2	1 33	11 11	1 57	12 3																	
Th.	26	11 28	11 8	10 8	11 30	10 10	5 25	18 7	5 46	19 0	2 20	12 6	2 42	12 10																	
F.	27	morn.	11 51	11 0	—	—	6 7	19 3	6 27	19 7	3 3	13 1	3 20	13 4																	
S.	28	0 18	0 10	11 2	0 29	11 3	6 47	19 10	7 6	20 2	3 39	13 7	3 57	13 10																	
S.	29	1 8	0 47	11 4	1 6	11 4	7 25	20 4	7 44	20 6	4 16	14 1	4 34	14 2																	
M.	30	1 58	1 25	11 4	1 43	11 5	8 2	20 8	8 20	20 9	4 52	14 3	5 10	14 3																	
Tu.	31	2 47	2 2	11 5	2 21	11 4	8 39	20 10	8 58	20 8	5 29	14 2	5 49	14 1																	
Half Mean Spring } Range.			5ft. 9in.					10ft. 5in.					7ft. 2in.																		
Phases of the Moon.																Moon's Declination at Noon.															
D. H. M.																M.D. ° ' "															
Last Quarter- 5 2 3 Afternoon.																1 11 S. 43 9 17 N. 27 17 0 S. 36 25 18 S. 14															
New - - - 12 5 35 Morning.																2 8 13 10 18 25 18 4 27 26 17 13															
First Quarter- 19 3 44 Afternoon.																3 4 15 11 18 9 19 8 3 27 15 20															
Full - - - 27 4 13 Afternoon.																4 0 N. 0 12 16 42 20 11 16 28 12 39															
																5 4 20 13 14 14 21 14 1 29 9 16															
In Perigee - 9 7 0 Afternoon.																6 8 30 14 11 1 22 16 11 30 5 23															
In Apogee - 21 5 0 Afternoon.																7 12 16 15 7 19 23 17 40 31 1 10															
																8 15 20 16 3 23 24 18 22															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. **HULL** add 1 m. **SUNDERLAND** add 5 m.

JULY, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
●	1	5 13 12 3	5 33 12 3	4 7 15 3	4 27 15 3	10 17 12 3	10 37 12 3	18.6						
M.	2	5 53 12 2	6 13 12 1	4 47 15 2	5 8 15 1	10 58 11 11	11 21 11 9	19.6						
Tu.	3	6 35 12 0	6 57 11 11	5 30 14 11	5 53 14 10	11 45 11 7	— —	20.6						
W.	4	7 21 11 9	7 47 11 6	6 17 14 7	6 43 14 4	0 9 11 5	0 34 11 2	21.6						
Th.	5	8 14 11 3	8 46 11 0	7 9 14 2	7 41 13 11	1 1 11 0	1 32 10 9	22.6						
F.	6	9 21 10 10	9 56 10 10	8 14 13 9	8 48 13 7	2 5 10 8	2 40 10 7	23.6						
S.	7	10 32 10 11	11 6 11 0	9 25 13 7	10 1 13 8	3 18 10 6	3 58 10 6	24.6						
●	8	11 39 11 2	— —	10 33 13 10	11 4 14 1	4 33 10 7	5 6 10 9	25.6						
M.	9	0 11 11 5	0 41 11 8	11 34 14 5	— —	5 36 11 0	6 7 11 5	26.6						
Tu.	10	1 11 11 11	1 40 12 3	0 4 14 9	0 34 15 2	6 34 11 11	7 0 12 5	27.6						
W.	11	2 8 12 7	2 36 12 11	1 3 15 6	1 31 15 11	7 25 12 10	7 48 13 3	28.6						
Th.	12	3 0 13 2	3 24 13 4	1 57 16 3	2 21 16 6	8 10 13 6	8 33 13 7	29.6						
F.	13	3 47 13 6	4 11 13 7	2 45 16 8	3 8 16 8	8 56 13 7	9 18 13 7	30.6						
S.	14	4 34 13 6	4 56 13 4	3 30 16 7	3 51 16 5	9 40 13 5	10 2 13 3	31.6						
●	15	5 18 13 2	5 40 12 11	4 13 16 3	4 35 16 0	10 25 12 11	10 47 12 8	32.6						
M.	16	6 2 12 8	6 23 12 6	4 57 15 9	5 17 15 6	11 8 12 4	11 30 12 0	33.6						
Tu.	17	6 43 12 3	7 5 11 11	5 38 15 2	6 1 14 10	11 53 11 7	— —	34.6						
W.	18	7 28 11 7	7 51 11 2	6 25 14 5	6 46 14 0	0 16 11 3	0 39 10 10	35.6						
Th.	19	8 15 10 9	8 40 10 4	7 9 13 7	7 35 13 2	1 2 10 5	1 26 10 1	36.6						
F.	20	9 9 10 1	9 39 9 10	8 3 12 10	8 33 12 7	1 54 9 10	2 24 9 6	37.6						
S.	21	10 14 9 9	10 46 9 9	9 7 12 5	9 41 12 4	2 59 9 4	3 36 9 3	38.6						
●	22	11 18 9 10	11 50 9 11	10 13 12 4	10 44 12 5	4 11 9 2	4 44 9 2	39.6						
M.	23	— —	0 22 10 11	11 15 12 7	11 46 12 10	5 17 9 3	5 48 9 6	40.6						
Tu.	24	0 52 10 3	1 19 10 6	— —	0 13 13 1	6 15 9 9	6 37 10 2	41.6						
W.	25	1 42 10 9	2 4 11 0	0 36 13 5	0 58 13 9	6 57 10 7	7 16 11 1	42.6						
Th.	26	2 25 11 4	2 45 11 8	1 19 14 2	1 40 14 7	7 33 11 6	7 50 11 11	43.6						
F.	27	3 3 12 0	3 21 12 3	2 1 15 0	2 19 15 3	8 7 12 3	8 25 12 7	44.6						
S.	28	3 39 12 6	3 58 12 9	2 37 15 7	2 55 15 10	8 43 12 9	9 1 12 11	45.6						
●	29	4 17 12 11	4 35 13 0	3 13 15 11	3 30 16 0	9 19 13 0	9 38 13 0	46.6						
M.	30	4 54 13 0	5 13 13 0	3 48 16 0	4 7 16 0	9 57 13 0	10 17 13 0	47.6						
Tu.	31	5 32 12 11	5 53 12 10	4 27 16 0	4 48 15 11	10 38 12 10	11 0 12 8	48.6						

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	28	Sub.	9	4	51	Sub.	17	5	49	Sub.	25	6	13	Sub.
2	3	39		10	5	0		18	5	54		26	6	13	
3	3	50		11	5	8		19	5	58		27	6	13	
4	4	1		12	5	16		20	6	2		28	6	12	
5	4	12		13	5	24		21	6	5		29	6	10	
6	4	22		14	5	31		22	6	8		30	6	8	
7	4	32		15	5	37		23	6	10		31	6	6	
8	4	42		16	5	43		24	6	12					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

TIDE TABLES FOR THE

JULY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
S.	1	2m23	1	42	9	5	2	0	9	5	0	52	24	8	1	11	24	8	8	1	19	8	8	20	19	8
M.	2	3 12	2	19	9	5	2	39	9	5	1	30	24	5	1	49	24	3	8	40	19	6	9	1	19	4
T.	3	4 0	3	0	9	4	3	20	9	4	2	10	24	0	2	31	23	9	9	23	19	2	9	43	18	11
W.	4	4 49	3	41	9	3	4	4	9	2	2	52	23	6	3	15	23	2	10	4	18	7	10	27	18	3
Th.	5	5 39	4	28	9	1	4	56	9	0	3	39	22	9	4	8	22	4	10	52	17	11	11	16	17	6
F.	6	6 30	5	25	8	11	5	54	8	10	4	40	22	0	5	13	21	9	11	41	17	2	—	—	—	—
S.	7	7 24	6	27	8	9	7	1	8	8	5	49	21	10	6	29	21	11	0	10	17	1	0	42	17	1
S.	8	8 20	7	35	8	9	8	10	8	10	7	5	22	3	7	39	22	8	1	20	17	3	2	0	17	7
M.	9	9 19	8	44	9	0	9	18	9	2	8	12	23	3	8	43	23	10	2	37	18	1	3	14	18	8
Tu.	10	10 19	9	51	9	4	10	23	9	5	9	14	24	6	9	43	25	0	3	49	19	4	4	23	19	10
W.	11	11 19	10	54	9	6	11	22	9	7	10	10	25	6	10	36	25	10	4	56	20	5	5	26	20	10
Th.	12	0a18	11	49	9	9	—	—	—	—	11	1	26	2	11	26	26	5	5	53	21	1	6	18	21	4
F.	13	1 14	0	14	9	10	0	39	9	10	11	50	26	6	—	—	—	6	42	21	6	7	5	21	6	6
S.	14	2 7	1	3	9	11	1	26	9	11	0	14	26	7	0	36	26	5	7	26	21	5	7	47	21	2
S.	15	2 56	1	47	9	10	2	8	9	9	0	57	26	3	1	18	25	11	8	8	20	10	8	29	20	6
M.	16	3 44	2	28	9	8	2	48	9	7	1	38	25	5	1	58	24	11	8	50	20	2	9	10	19	8
Tu.	17	4 29	3	8	9	5	3	27	9	4	2	18	24	4	2	38	23	9	9	29	19	2	9	49	18	7
W.	18	5 13	3	47	9	2	4	8	9	0	2	58	23	2	3	19	22	6	10	8	18	0	10	27	17	5
Th.	19	5 57	4	28	8	10	4	50	8	9	3	39	21	10	4	2	21	3	10	46	16	11	11	5	16	3
F.	20	6 41	5	13	8	7	5	39	8	5	4	28	20	8	4	57	20	1	11	27	15	9	11	54	15	5
S.	21	7 26	6	9	8	3	6	41	8	2	5	31	19	11	6	6	19	8	—	—	—	0	23	15	2	2
S.	22	8 12	7	13	8	1	7	46	8	1	6	43	19	9	7	17	19	11	0	55	15	1	1	32	15	2
M.	23	8 59	8	23	8	2	8	55	8	3	7	51	20	3	8	24	20	8	2	12	15	5	2	47	15	9
Tu.	24	9 48	9	25	8	5	9	52	8	7	8	51	21	2	9	15	21	8	3	20	16	3	3	48	16	10
W.	25	10 38	10	17	8	8	10	39	8	10	9	38	22	3	9	59	22	9	4	15	17	4	4	40	17	11
Th.	26	11 28	11	2	8	11	11	24	9	0	10	19	23	4	10	39	23	9	5	5	18	5	5	28	18	11
F.	27	morn.	11	45	9	2	—	—	—	—	10	58	24	2	11	18	24	7	5	50	19	4	6	10	19	9
S.	28	0 18	0	6	9	3	0	26	9	5	11	37	25	0	11	56	25	4	6	29	20	1	6	48	20	5
S.	29	1 8	0	45	9	6	1	4	9	7	—	—	—	0	15	25	7	7	6	20	8	7	24	20	9	9
M.	30	1 58	1	23	9	8	1	42	9	9	0	34	25	9	0	52	25	11	7	42	20	10	8	1	20	11
Tu.	31	2 47	2	0	9	9	2	20	9	9	1	11	25	11	1	30	25	8	8	21	20	9	8	42	20	7

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	5	2	3	Afternoon.
New - - - - -	12	5	35	Morning.
First Quarter -	19	3	44	Afternoon.
Full - - - - -	27	4	13	Afternoon.
<hr/>				
In Perigee - -	9	7	0	Afternoon.
In Apogee - -	21	5	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'	
1	11	S.	43	9	17	N.	27	17	0	S.	36	25	18	S.	14
2	8	13		10	18	25		18	4	27		26	17	13	
3	4	15		11	18	9		19	8	3		27	15	20	
4	0	N.	0	12	16	42		20	11	16		28	12	39	
5	4	20		13	14	14		21	14	1		29	9	16	
6	8	30		14	11	1		22	16	11		30	5	23	
7	12	16		15	7	19		23	17	40		31	1	10	
8	15	20		16	3	23		24	18	22					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

JULY, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
A.	1	8 43 35	6	9 1 35	5	11 58 15	1	—	—	0 41 10	5	1 1 10	4	18.6
M.	2	9 20 35	3	9 39 35	0	0 19 15	0	0 41 14	7	1 22 10	3	1 43 10	2	19.6
Tu.	3	9 58 34	8	10 15 34	3	1 4 14	9	1 27 14	7	2 4 10	1	2 27 10	0	20.6
W.	4	10 34 33	8	10 54 33	1	1 51 14	5	2 16 14	11	2 50 11	11	3 15 9	10	21.6
Th.	5	11 19 32	5	11 45 31	10	2 42 14	1	3 13 13	10	3 41 9	9	4 11 9	7	22.6
F.	6	—	—	0 14 31	5	3 46 13	8	4 21 13	7	4 45 9	6	5 18 9	5	23.6
S.	7	0 46 31	2	1 21 31	2	4 58 13	8	5 34 13	9	5 50 9	5	6 22 9	6	24.6
A.	8	1 56 31	6	2 33 32	0	6 6 13	11	6 38 14	2	6 53 11	7	7 25 9	9	25.6
M.	9	3 10 32	7	3 50 33	5	7 9 14	5	7 39 14	9	7 57 10	0	8 30 10	2	26.6
Tu.	10	4 28 34	5	5 43 35	3	8 10 15	2	8 38 15	5	9 4 10	4	9 37 10	6	27.6
W.	11	5 38 36	2	6 7 36	10	9 5 15	9	9 30 16	0	10 6 10	9	10 28 10	11	28.6
Th.	12	6 35 37	4	7 1 37	8	9 55 16	2	10 18 16	3	10 52 11	1	11 15 11	2	29.6
F.	13	7 26 38	0	7 49 38	1	10 40 16	4	11 1 16	4	11 39 11	2	—	—	1.3
S.	14	8 10 37	11	8 30 37	8	11 21 16	3	11 43 16	1	0 2 11	1	0 24 11	0	2.3
A.	15	8 50 37	4	9 10 36	10	—	—	0 6 15	10	0 46 10	11	1 9 10	9	3.3
M.	16	9 28 36	3	9 46 35	6	0 28 15	7	0 50 15	4	1 31 10	7	1 52 10	5	4.3
Tu.	17	10 4 34	8	10 22 33	9	1 12 15	0	1 35 14	7	2 13 10	3	2 35 10	0	5.3
W.	18	10 37 32	9	10 54 31	9	1 58 14	3	2 20 13	11	2 58 9	10	3 19 9	8	6.3
Th.	19	11 13 30	9	11 34 29	11	2 42 13	6	3 7 13	2	3 41 9	5	4 5 9	3	7.3
F.	20	11 59 29	1	—	—	3 35 12	10	4 5 12	7	4 33 9	0	5 3 8	10	8.3
S.	21	0 29 28	6	1 0 28	2	4 40 12	6	5 14 12	5	5 33 11	9	6 4 8	9	9.3
A.	22	1 33 28	0	2 7 28	1	5 46 12	5	6 18 12	6	6 34 8	9	7 4 8	10	10.3
M.	23	2 45 28	5	3 20 28	11	6 50 12	8	7 20 12	11	7 36 9	0	8 8 9	11	11.3
Tu.	24	3 54 29	7	4 26 30	4	7 47 13	2	8 11 13	5	8 37 9	3	9 4 9	5	12.3
W.	25	4 55 31	3	5 21 32	1	8 33 13	9	8 54 14	1	9 30 9	7	9 53 9	9	13.3
Th.	26	5 46 33	0	6 9 33	9	9 14 14	5	9 34 14	9	10 14 10	0	10 32 10	2	14.3
F.	27	6 31 34	6	6 52 35	1	9 53 14	11	10 11 15	2	10 50 10	4	11 8 10	6	15.3
S.	28	7 12 35	8	7 32 36	3	10 28 15	5	10 45 15	7	11 26 10	8	11 44 10	9	16.3
A.	29	7 50 36	8	8 8 36	11	11 1 15	9	11 19 15	10	—	—	0 3 10	9	17.3
M.	30	8 25 37	2	8 43 37	3	11 38 15	10	11 58 15	10	0 22 10	10	0 41 10	10	18.3
Tu.	31	9 1 37	2	9 21 37	0	—	—	0 19 15	11	1 1 10	10	1 22 10	9	19.3
Half Mean Spring } 18ft. 7in.														
Range. } 8ft. 0in.														
} 5ft. 6in.														

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 28	Sub.	9	4 51	Sub.	17	5 49	Sub.	25	6 13	Sub.
2	3 39		10	5 0		18	5 54		26	6 13	
3	3 50		11	5 8		19	5 58		27	6 13	
4	4 1		12	5 16		20	6 2		28	6 12	
5	4 12		13	5 24		21	6 5		29	6 10	
6	4 22		14	5 31		22	6 8		30	6 8	
7	4 32		15	5 37		23	6 10		31	6 6	
8	4 42		16	5 43		24	6 12				

T

re given for Mean Time at Place; if Greenwich or Railway Time be required,—fo
12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JULY, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.								
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.						
☉.	1	2m23	0 17	9 1	0 37	9 2	9 44	7 1	10 2	7 0	7 6	10 5	7 26	10 3												
M.	2	3 12	0 58	9 1	1 19	9 1	10 22	6 11	10 43	6 10	7 46	10 1	8 6	9 11												
Tu.	3	4 0	1 43	9 0	2 7	9 0	11 5	6 8	11 31	6 7	8 28	9 9	8 51	9 7												
W.	4	4 49	2 31	8 11	2 57	8 10	—	—	0 2	6 5	9 18	9 5	9 47	9 4												
Th.	5	5 29	3 24	8 8	3 55	8 7	0 35	6 3	1 13	6 1	10 20	9 2	10 56	9 1												
F.	6	6 30	4 27	8 7	4 59	8 6	1 53	6 1	2 33	6 1	11 31	9 1	—	—												
S.	7	7 24	5 32	8 6	6 4	8 5	3 9	6 3	3 41	6 5	0 5	9 1	0 38	9 2												
☉.	8	8 20	6 37	8 5	7 11	8 6	4 10	6 8	4 36	6 10	1 11	9 3	1 44	9 5												
M.	9	9 19	7 42	8 8	8 13	8 10	5 0	7 0	5 27	7 1	2 15	9 8	2 45	10 0												
Tu.	10	10 19	8 43	9 0	9 13	9 2	5 54	7 3	6 23	7 5	3 14	10 3	3 41	10 7												
W.	11	11 19	9 41	9 4	10 6	9 6	6 53	7 7	7 19	7 8	4 7	10 11	4 32	11 2												
Th.	12	0a18	10 31	9 7	10 55	9 7	7 45	7 10	8 9	7 11	4 58	11 4	5 23	11 5												
F.	13	1 14	11 18	9 7	11 39	9 6	8 31	7 11	8 51	7 11	5 47	11 6	6 9	11 6												
S.	14	2 7	11 59	9 6	—	—	9 11	7 9	9 31	7 7	6 30	11 4	6 52	11 2												
☉.	15	2 56	0 22	9 5	0 45	9 5	9 51	7 5	10 11	7 3	7 14	10 11	7 35	10 8												
M.	16	3 44	1 7	9 4	1 28	9 3	10 31	7 1	10 51	6 11	7 55	10 4	8 14	10 1												
Tu.	17	4 29	1 51	9 1	2 15	9 0	11 13	6 8	11 40	6 5	8 36	9 9	8 59	9 6												
W.	18	5 13	2 39	8 10	3 2	8 8	—	—	0 7	6 2	9 23	9 2	9 48	8 11												
Th.	19	5 57	3 25	8 6	3 49	8 4	0 36	5 11	1 7	5 9	10 14	8 8	10 44	8 6												
F.	20	6 41	4 15	8 3	4 44	8 2	1 40	5 8	2 16	5 6	11 15	8 4	11 47	8 3												
S.	21	7 26	5 14	8 1	5 45	8 0	2 51	5 7	3 23	5 8	—	—	0 18	8 2												
☉.	22	8 12	6 16	7 11	6 48	7 11	3 52	5 9	4 20	5 11	0 50	8 2	1 23	8 3												
M.	23	8 59	7 23	7 11	7 54	8 0	4 48	6 0	5 13	6 2	1 56	8 4	2 27	8 6												
Tu.	24	9 48	8 21	8 2	8 45	8 4	5 35	6 3	5 56	6 5	2 53	8 9	3 16	9 0												
W.	25	10 38	9 8	8 7	9 29	8 9	6 17	6 6	6 38	6 8	3 37	9 4	3 56	9 7												
Th.	26	11 28	9 50	8 11	10 10	9 0	7 0	6 10	7 22	7 0	4 16	9 11	4 36	10 2												
F.	27	morn.	10 28	9 1	10 47	9 2	7 42	7 2	8 1	7 3	4 55	10 5	5 15	10 8												
S.	28	0 18	11 5	9 3	11 23	9 3	8 18	7 5	8 35	7 6	5 34	10 10	5 52	11 0												
☉.	29	1 8	11 39	9 4	11 57	9 4	8 51	7 6	9 9	7 7	6 9	11 0	6 27	11 0												
M.	30	1 58	—	—	0 17	9 5	9 26	7 6	9 44	7 6	6 46	11 0	7 6	10 11												
Tu.	31	2 47	0 37	9 5	0 58	9 4	10 2	7 5	10 23	7 4	7 26	10 9	7 47	10 7												
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.															
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
Last Quarter - 5 2 3 Afternoon.												1 11 S. 43 9 17 N. 27 17 0 S. 36 25 18 S. 14														
New - - - - 12 5 35 Morning.												2 8 13 10 18 25 18 4 27 26 17 13														
First Quarter 19 3 44 Afternoon.												3 4 15 11 18 9 19 8 3 27 15 20														
Full - - - - 27 4 13 Afternoon.												4 0 N. 0 12 16 42 20 11 16 28 12 39														
In Perigee - - 9 7 0 Afternoon.												5 4 20 13 14 14 21 14 1 29 9 16														
In Apogee - - 21 5 0 Afternoon.												6 8 30 14 11 1 22 16 11 30 5 23														
												7 12 16 15 7 19 23 17 40 31 1 10														
												8 15 20 16 3 23 24 18 22														

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

JULY, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
S.	1	6	27	13	10	6	47	13	9	6	53	11	2	7	14	11	11	7	33	11	11	18.6				
M.	2	7	7	13	8	7	29	13	6	7	32	11	0	7	53	10	10	7	52	11	11	19.6				
Tu.	3	7	52	13	4	8	15	13	2	8	13	10	9	8	33	10	8	8	32	11	9	20.6				
W.	4	8	40	12	10	9	6	12	6	8	54	10	6	9	18	10	4	9	12	11	6	21.6				
Th.	5	9	34	12	3	10	6	12	0	9	44	10	2	10	10	10	0	9	58	11	2	(
F.	6	10	38	11	11	11	13	12	0	10	38	9	11	11	12	9	11	11	0	10	10	23.6				
S.	7	11	50	12	1	—	—	—	—	11	46	9	11	—	—	—	—	—	—	—	—	24.6				
S.	8	0	23	12	3	0	56	12	6	0	21	10	0	0	57	10	2	0	35	10	9	25.6				
M.	9	1	26	12	10	1	57	13	3	1	34	10	5	2	10	10	8	1	42	11	1	26.6				
Tu.	10	2	28	13	7	2	59	13	11	2	44	10	11	3	17	11	2	2	58	11	8	27.6				
W.	11	3	27	14	3	3	53	14	7	3	48	11	5	4	15	11	8	4	7	12	2	28.6				
Th.	12	4	18	14	10	4	42	15	0	4	41	11	10	5	7	11	11	5	4	12	6	●				
F.	13	5	5	15	2	5	29	15	2	5	32	12	0	5	56	12	0	5	53	12	8	1.3				
S.	14	5	51	15	1	6	13	14	11	6	18	11	11	6	39	11	10	6	38	12	8	2.3				
S.	15	6	34	14	8	6	56	14	5	7	0	11	8	7	21	11	5	7	21	12	6	3.3				
M.	16	7	17	14	1	7	38	13	9	7	41	11	3	8	1	11	0	8	1	12	2	4.3				
Tu.	17	8	0	13	4	8	23	12	11	8	20	10	9	8	39	10	6	8	39	11	9	5.3				
W.	18	8	44	12	5	9	6	11	10	8	58	10	2	9	18	9	10	9	15	11	3	6.3				
Th.	19	9	28	11	6	9	54	11	1	9	38	9	7	9	59	9	4	9	52	10	8	7.3				
F.	20	10	23	10	10	10	55	10	8	10	23	9	2	10	54	9	0	10	46	10	1	8.3				
S.	21	11	29	10	7	—	—	—	—	11	26	8	11	12	0	8	11	11	45	9	9	9.3				
S.	22	0	2	10	7	0	35	10	9	—	—	—	—	0	33	9	0	0	15	9	7	10.3				
M.	23	1	8	10	11	1	38	11	2	1	8	9	1	1	44	9	3	1	19	9	9	11.3				
Tu.	24	2	4	11	5	2	28	11	9	2	16	9	6	2	44	9	8	2	25	10	2	12.3				
W.	25	2	52	12	1	3	14	12	5	3	9	9	11	3	33	10	3	3	24	10	8	13.3				
Th.	26	3	36	12	10	3	56	13	2	3	56	10	6	4	18	10	9	4	15	11	2	14.3				
F.	27	4	15	13	6	4	34	13	10	4	38	10	11	4	58	11	2	5	0	11	7	○				
S.	28	4	52	14	2	5	11	14	5	5	18	11	4	5	38	11	6	5	39	11	11	16.3				
S.	29	5	30	14	6	5	49	14	8	5	57	11	7	6	16	11	8	6	17	12	3	17.3				
M.	30	6	8	14	9	6	27	14	8	6	34	11	8	6	53	11	8	6	55	12	5	18.3				
Tu.	31	6	47	14	7	7	9	14	5	7	12	11	7	7	33	11	6	7	34	12	5	19.3				
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	28	Sub.	9	4	51	Sub.	17	5	49	Sub.	25	6	13	Sub.
2	3	39		10	5	0		18	5	54		26	6	13	
3	3	50		11	5	8		19	5	58		27	6	13	
4	4	1		12	5	16		20	6	2		28	6	12	
5	4	12		13	5	24		21	6	5		29	6	10	
6	4	22		14	5	31		22	6	8		30	6	8	
7	4	32		15	5	37		23	6	10		31	6	6	
8	4	42		16	5	43		24	6	12					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.				
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
W.	1	3m37	6	36	18	5	6	57	18	0	8	27	14	9	8	46	14	11	2	15	12	6	2	37	12	4
Th.	2	4 28	7	20	17	6	7	45	17	0	9	6	14	5	9	27	14	5	2	58	12	2	3	20	12	0
F.	3	5 20	8	11	16	5	8	39	15	10	9	51	13	11	10	17	13	8	3	44	11	9	4	9	11	6
S.	4	6 14	9	8	15	5	9	41	15	1	10	45	13	5	11	15	13	2	4	36	11	3	5	4	11	0
♄.	5	7 10	10	18	14	11	10	59	14	11	11	50	13	0	—	—	—	—	5	35	10	9	6	10	10	7
M.	6	8 8	11	40	15	1	—	—	—	—	0	30	12	11	1	13	13	1	6	48	10	7	7	28	10	9
Tu.	7	9 7	0	22	15	6	0	57	16	0	1	54	13	2	2	34	13	9	8	10	11	0	8	47	11	4
W.	8	10 5	1	31	16	7	2	1	17	3	3	11	13	10	3	44	14	6	9	23	11	7	9	55	11	11
Th.	9	11 1	2	29	18	0	2	53	18	7	4	14	14	6	4	42	15	4	10	24	12	3	10	49	12	5
F.	10	11 55	3	16	19	1	3	38	19	4	5	9	15	0	5	33	15	10	11	12	12	7	11	34	12	9
S.	11	0a46	4	0	19	6	4	22	19	6	5	56	15	4	6	17	16	0	11	56	12	10	—	—	—	—
♄.	12	1 35	4	41	19	6	4	59	19	5	6	38	15	6	6	58	16	0	0	18	12	10	0	39	12	10
M.	13	2 21	5	18	19	3	5	36	19	0	7	15	15	4	7	31	15	7	0	59	12	9	1	18	12	8
Tu.	14	3 6	5	53	18	7	6	11	18	3	7	48	14	11	8	5	15	0	1	37	12	7	1	54	12	5
W.	15	3 51	6	29	17	9	6	47	17	1	8	22	14	4	8	37	14	3	2	12	12	3	2	30	12	0
Th.	16	4 35	7	5	16	6	7	24	15	10	8	50	13	8	9	5	13	5	2	48	11	9	3	5	11	6
F.	17	5 20	7	44	15	2	8	4	14	6	9	22	13	0	9	41	12	7	3	23	11	2	3	42	10	11
S.	18	6 6	8	28	13	11	8	54	13	5	10	0	12	3	10	24	11	11	4	2	10	7	4	25	10	4
♄.	19	6 52	9	26	13	1	10	1	12	10	10	50	11	9	11	21	11	5	4	50	10	0	5	20	9	9
M.	20	7 40	10	41	12	10	11	20	13	0	11	58	11	7	—	—	—	—	5	54	9	7	6	31	9	6
Tu.	21	8 29	11	59	13	3	—	—	—	—	0	36	11	5	1	15	11	11	7	8	9	7	7	46	9	10
W.	22	9 19	0	36	13	8	1	6	14	3	1	55	11	11	2	31	12	8	8	24	10	1	8	57	10	6
Th.	23	10 9	1	35	15	0	1	57	15	8	3	4	12	9	3	36	13	8	9	26	10	10	9	51	11	2
F.	24	11 0	2	18	16	5	2	39	17	2	4	2	13	6	4	26	14	6	10	13	11	6	10	35	11	10
S.	25	11 50	2	59	17	11	3	19	18	7	4	50	14	3	5	12	15	2	10	55	12	1	11	15	12	5
♄.	26	morn.	3	38	19	1	3	57	19	5	5	33	14	11	5	53	15	9	11	34	12	8	11	53	12	10
M.	27	0 41	4	17	19	9	4	37	19	11	6	13	15	5	6	33	16	1	—	—	—	—	0	13	13	0
Tu.	28	1 32	4	55	20	1	5	14	20	1	6	54	15	8	7	12	16	1	0	34	13	1	0	54	13	1
W.	29	2 24	5	34	19	11	5	54	19	8	7	31	15	8	7	51	15	11	1	14	13	1	1	35	13	0
Th.	30	3 16	6	14	19	4	6	36	18	10	8	12	15	5	8	33	15	4	1	55	13	0	2	15	12	10
F.	31	4 11	6	58	18	2	7	23	17	6	8	52	14	11	9	12	14	8	2	37	12	7	2	59	12	4
Half Mean Spring } Range.			9 ^{ft.} 6 ^{in.}								7 ^{ft.} 9 ^{in.}								6 ^{ft.} 4 ^{in.}							

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	3	7	16	Afternoon.	1	3	N.10	9	15	N.16	17	12	S.58	25	10	S.28
New - - - - -	10	2	36	Afternoon.	2	7	22	10	12	23	18	15	21	26	6	42
First Quarter -	18	9	16	Morning.	3	11	12	11	8	53	19	17	4	27	2	30
Full - - - - -	26	3	34	Morning.	4	14	25	12	5	1	20	18	4	28	1	N.53
					5	16	47	13	1	1	21	18	14	29	6	13
In Perigee - -	5	11	0	Afternoon.	6	18	6	14	2	S.55	22	17	34	30	10	12
In Apogee - -	18	11	0	Morning.	7	18	17	15	6	39	23	16	1	31	13	36
In Perigee - -	30	12	0	Midnight.	8	17	18	16	10	2	24	13	37			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
W.	1	1	55	18	7	2	17	18	5	3	23	15	11	3	44	15	9	4	54	19	1	5	16	19	0	20'3
Th.	2	2	39	18	1	3	2	17	9	4	6	15	7	4	28	15	4	5	36	18	10	5	58	18	7	21'3
F.	3	3	25	17	4	3	50	16	11	4	50	15	1	5	15	14	9	6	21	18	4	6	46	18	0	(
S.	4	4	16	16	6	4	42	16	0	5	43	14	6	6	13	14	3	7	13	17	8	7	41	17	4	23'3
S.	5	5	11	15	7	5	41	15	5	6	45	13	11	7	21	13	9	8	14	17	1	8	50	16	10	24'3
M.	6	6	15	15	4	6	54	15	7	8	0	13	9	8	40	13	10	9	28	16	9	10	8	16	7	25'3
Tu.	7	7	36	15	11	8	12	16	5	9	20	14	1	9	59	14	4	10	48	16	8	11	25	16	10	26'3
W.	8	8	46	16	10	9	18	17	4	10	33	14	8	11	5	15	0	—	—	—	0	1	17	2	27'3	
Th.	9	9	48	17	10	10	15	18	3	11	34	15	4	—	—	—	—	0	34	17	6	1	3	17	11	28'3
F.	10	10	40	18	7	11	4	18	10	0	1	15	8	0	26	15	11	1	31	18	3	1	56	18	8	●
S.	11	11	28	18	11	11	51	19	0	0	49	16	2	1	11	16	4	2	18	19	0	2	41	19	2	0'9
S.	12	—	—	—	—	0	13	19	1	1	32	16	5	1	54	16	5	3	2	19	4	3	22	19	5	1'9
M.	13	0	33	19	0	0	53	18	10	2	13	16	4	2	31	16	3	3	40	19	6	3	59	19	5	2'9
Tu.	14	1	14	18	8	1	33	18	5	2	48	16	2	3	6	16	0	4	19	19	4	4	37	19	2	3'9
W.	15	1	52	18	2	2	10	17	10	3	23	15	9	3	41	15	6	4	54	18	11	5	11	18	9	4'9
Th.	16	2	29	17	5	2	47	16	11	3	59	15	2	4	17	14	10	5	28	18	5	5	47	18	0	5'9
F.	17	3	5	16	5	3	23	15	11	4	35	14	6	4	54	14	2	6	6	17	8	6	24	17	3	6'9
S.	18	3	43	15	5	4	6	14	11	5	14	13	10	5	36	13	6	6	44	16	11	7	6	16	6)
S.	19	4	29	14	5	4	56	14	0	6	3	13	2	6	31	12	10	7	31	16	2	7	58	15	10	8'9
M.	20	5	27	13	9	6	0	13	7	7	5	12	8	7	42	12	7	8	32	15	7	9	10	15	5	9'9
Tu.	21	6	34	13	9	7	12	14	1	8	23	12	7	9	0	12	9	9	48	15	3	10	25	15	4	10'9
W.	22	7	51	14	6	8	22	15	0	9	37	13	0	10	13	13	4	11	5	15	6	11	40	15	9	11'9
Th.	23	8	50	15	7	9	14	16	1	10	42	13	8	11	9	14	1	—	—	—	0	11	16	1	12'9	
F.	24	9	37	16	8	9	59	17	2	11	31	14	5	11	51	14	10	0	36	16	6	0	59	16	11	13'9
S.	25	10	21	17	8	10	43	18	2	—	—	—	—	0	11	15	2	1	22	17	4	1	43	17	10	14'9
S.	26	11	4	18	7	11	25	18	11	0	31	15	6	0	51	15	10	2	2	18	3	2	21	18	8	○
M.	27	11	46	19	2	—	—	—	—	1	11	16	2	1	29	16	4	2	41	19	0	2	59	19	4	16'9
Tu.	28	0	8	19	4	0	28	19	6	1	49	16	6	2	8	16	7	3	18	19	7	3	38	19	9	17'9
W.	29	0	50	19	6	1	12	19	5	2	26	16	7	2	45	16	7	3	56	19	10	4	16	19	10	18'9
Th.	30	1	34	19	4	1	55	19	1	3	4	16	6	3	24	16	4	4	36	19	9	4	55	19	7	19'9
F.	31	2	17	18	9	2	40	18	3	3	44	16	1	4	6	15	10	5	16	19	5	5	37	19	1	20'9
Half Mean Spring } Range.		9ft. 4in.								8ft. 0in.								9ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2	Sub.	9	5	16	Sub.	17	3	53	Sub.	25	1	56	Sub.
2	5	59		10	5	7		18	3	40		26	1	40	
3	5	54		11	4	58		19	3	26		27	1	23	
4	5	49		12	4	49		20	3	13		28	1	5	
5	5	44		13	4	39		21	2	58		29	0	48	
6	5	38		14	4	28		22	2	43		30	0	30	
7	5	31		15	4	17		23	2	28		31	0	11	
8	5	24		16	4	5		24	2	12					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.				
W.	1	3 m 37	2 41	11 4	3 2	11 3	9 20	20 5	9 42	20 2	6 11	13 11	6 33	13 8												
Th.	2	4 28	3 24	11 1	3 45	11 0	10 3	19 9	10 25	19 5	6 56	13 5	7 21	13 3												
F.	3	5 20	4 7	10 10	4 30	10 8	10 51	19 0	11 21	18 7	7 47	12 11	8 15	12 7												
S.	4	6 14	4 56	10 6	5 24	10 4	11 54	18 2	—	—	8 45	12 3	9 17	12 0												
S.	5	7 10	5 54	10 3	6 27	10 2	0 30	17 9	1 5	17 5	9 52	11 10	10 29	11 9												
M.	6	8 8	7 7	10 2	7 48	10 3	1 38	17 4	2 13	17 5	11 6	11 9	11 43	11 11												
Tu.	7	9 7	8 27	10 4	9 5	10 6	2 49	17 9	3 27	18 3	—	—	0 19	12 3												
W.	8	10 5	9 40	10 9	10 14	11 0	4 2	18 10	4 34	19 3	0 51	12 8	1 24	13 0												
Th.	9	11 1	10 45	11 2	11 13	11 5	5 3	19 9	5 30	20 2	1 56	13 4	2 25	13 8												
F.	10	11 55	11 39	11 7	—	—	5 55	20 7	6 19	20 10	2 51	14 0	3 14	14 3												
S.	11	0 a 46	0 2	11 8	0 24	11 9	6 42	21 1	7 4	21 2	3 34	14 5	3 55	14 7												
S.	12	1 35	0 45	11 9	1 6	11 9	7 25	21 3	7 46	21 3	4 15	14 8	4 35	14 9												
M.	13	2 21	1 26	11 8	1 45	11 7	8 4	21 2	8 22	21 0	4 54	14 8	5 12	14 5												
Tu.	14	3 6	2 3	11 6	2 22	11 4	8 41	20 10	8 58	20 5	5 31	14 2	5 49	13 11												
W.	15	3 51	2 40	11 2	2 59	11 0	9 17	20 0	9 35	19 6	6 8	13 7	6 26	13 3												
Th.	16	4 35	3 17	10 10	3 35	10 8	9 52	19 0	10 10	18 6	6 45	12 11	7 5	12 7												
F.	17	5 20	3 52	10 6	4 10	10 3	10 30	18 0	10 51	17 6	7 26	12 2	7 47	11 9												
S.	18	6 6	4 28	10 0	4 50	9 10	11 16	17 0	11 46	16 6	8 9	11 5	8 35	11 1												
S.	19	6 52	5 14	9 8	5 40	9 6	—	—	0 17	16 0	9 3	10 10	9 36	10 7												
M.	20	7 40	6 12	9 5	6 49	9 4	0 50	15 8	1 23	15 6	10 13	10 5	10 50	10 5												
Tu.	21	8 29	7 31	9 5	8 8	9 6	1 57	15 6	2 32	15 9	11 25	10 6	11 59	10 9												
W.	22	9 19	8 44	9 8	9 19	9 10	3 6	16 2	3 40	16 9	—	—	0 32	11 1												
Th.	23	10 9	9 49	10 1	10 18	10 4	4 11	17 3	4 37	17 10	1 1	11 6	1 28	12 0												
F.	24	11 0	10 42	10 7	11 3	10 10	5 0	18 5	5 20	19 0	1 52	12 4	2 14	12 9												
S.	25	11 50	11 24	11 1	11 44	11 4	5 40	19 6	6 0	20 0	2 36	13 2	2 56	13 7												
S.	26	morn.	—	—	0 5	11 6	6 21	20 5	6 41	20 10	3 16	13 11	3 33	14 3												
M.	27	0 41	0 24	11 8	0 42	11 9	7 0	21 2	7 20	21 5	3 52	14 7	4 12	14 10												
Tu.	28	1 32	1 1	11 10	1 21	11 10	7 40	21 8	7 59	21 9	4 31	15 0	4 49	15 0												
W.	29	2 24	1 40	11 10	2 0	11 10	8 18	21 9	8 38	21 7	5 9	14 11	5 29	14 9												
Th.	30	3 16	2 21	11 9	2 42	11 7	8 59	21 4	9 20	21 0	5 50	14 7	6 11	14 3												
F.	31	4 11	3 3	11 5	3 24	11 3	9 42	20 6	10 4	20 0	6 34	13 11	6 59	13 7												
Half Mean Spring Range			5ft. 9in.								10ft. 5in.								7ft. 2in.							

Half Mean Spring } 5ft. 9in.
Range

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	3	7	16	Afternoon.
New - - - -	10	2	36	Afternoon.
First Quarter	18	9	16	Morning.
Full - - - -	26	3	34	Morning.
In Perigree -	5	11	0	Afternoon.
In Apogee - -	18	11	0	Morning.
In Perigee - -	30	12	0	Midnight.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	3	N. 10	9	15	N. 16	17	12	S. 58	25	10	S. 28
2	7	22	10	12	23	18	15	21	26	6	42
3	11	12	11	8	53	19	17	4	27	2	30
4	14	25	12	5	1	20	18	4	28	1	N. 53
5	16	47	13	1	1	21	18	14	29	6	13
6	18	6	14	2	S. 55	22	17	34	30	10	12
7	18	17	15	6	39	23	16	1	31	13	36
8	17	18	16	10	2	24	13	37			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
W.	1	6 15 12 9	6 37 12 7	5 9 15 9	5 31 15 7	11 23 12 5	11 46 12 2	20° 3						
Th.	2	6 59 12 5	7 23 12 2	5 54 15 4	6 19 15 0	— —	0 11 11 10	21° 3						
F.	3	7 50 11 10	8 19 11 5	6 46 14 8	7 14 14 4	0 38 11 6	1 6 11 2	22° 3						
S.	4	8 51 11 1	9 26 10 10	7 46 14 0	8 20 13 8	1 37 10 11	2 11 10 7	23° 3						
S.	5	10 4 10 8	10 41 10 8	8 57 13 5	9 35 13 4	2 49 10 5	3 29 10 3	24° 3						
M.	6	11 18 10 9	11 56 10 11	10 12 13 5	10 49 13 7	4 11 10 3	4 50 10 4	25° 3						
Tu.	7	— —	0 32 11 2	11 25 13 10	11 58 14 2	5 27 10 6	5 59 10 11	26° 3						
W.	8	1 3 11 6	1 34 11 9	— —	0 28 14 7	6 29 11 4	6 55 11 11	27° 3						
Th.	9	2 2 12 1	2 28 12 6	0 56 15 1	1 23 15 7	7 19 12 5	7 40 12 11	28° 3						
F.	10	2 52 12 10	3 14 13 2	1 49 16 0	2 12 16 3	8 1 13 3	8 21 13 6	29° 3						
S.	11	3 34 13 4	3 55 13 6	2 33 16 6	2 53 16 7	8 41 13 7	9 1 13 7	30° 3						
S.	12	4 17 13 7	4 37 13 6	3 13 16 8	3 32 16 7	9 21 13 6	9 40 13 5	31° 3						
M.	13	4 56 13 4	5 15 13 2	3 51 16 5	4 10 16 2	9 59 13 2	10 19 13 0	32° 3						
Tu.	14	5 34 12 11	5 52 12 9	4 29 16 0	4 47 15 9	10 38 12 8	10 57 12 4	33° 3						
W.	15	6 11 12 6	6 30 12 2	5 6 15 6	5 25 15 1	11 16 11 11	11 36 11 6	34° 3						
Th.	16	6 49 11 10	7 8 11 6	5 44 14 9	6 3 14 4	11 56 11 2	— —	35° 3						
F.	17	7 28 11 1	7 50 10 8	6 24 13 11	6 45 13 5	0 16 10 9	0 37 10 4	36° 3						
S.	18	8 14 10 3	8 42 9 11	7 8 13 1	7 36 12 8	1 0 9 11	1 27 9 7	37° 3						
S.	19	9 12 9 7	9 48 9 5	8 6 12 4	8 40 12 1	1 57 9 3	2 32 9 0	38° 3						
M.	20	10 25 9 4	11 2 9 5	9 18 11 11	9 57 12 0	3 12 8 10	3 54 8 10	39° 3						
Tu.	21	11 38 9 7	— —	10 32 12 1	11 6 12 3	4 31 8 11	5 7 9 0	40° 3						
W.	22	0 13 9 9	0 46 10 11	11 39 12 7	— —	5 41 9 3	6 9 9 8	41° 3						
Th.	23	1 13 10 5	1 38 10 9	0 8 13 0	0 32 13 6	6 33 10 3	6 53 10 9	42° 3						
F.	24	1 59 11 2	2 19 11 7	0 53 13 11	1 14 14 6	7 11 11 4	7 27 11 11	43° 3						
S.	25	2 39 12 0	2 57 12 5	1 35 15 0	1 55 15 6	7 44 12 6	8 3 13 0	44° 3						
S.	26	3 16 12 10	3 34 13 2	2 14 15 11	2 33 16 4	8 21 13 4	8 39 13 7	45° 3						
M.	27	3 53 13 5	4 12 13 8	2 51 16 7	3 9 16 9	8 57 13 9	9 16 13 10	46° 3						
Tu.	28	4 32 13 9	4 51 13 9	3 27 16 10	3 46 16 10	9 36 13 10	9 56 13 9	47° 3						
W.	29	5 11 13 8	5 32 13 6	4 6 16 9	4 27 16 8	10 17 13 7	10 39 13 5	48° 3						
Th.	30	5 54 13 4	6 15 13 2	4 48 16 6	5 9 16 3	11 1 13 1	11 24 12 9	49° 3						
F.	31	6 37 12 11	7 1 12 6	5 32 15 11	5 57 15 6	11 49 12 4	— —	50° 3						
Half Mean Spring } Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2	Sub.	9	5	16	Sub.	17	3	53	Sub.	25	1	56	Sub.
2	5	59		10	5	7		18	3	40		26	1	40	
3	5	54		11	4	58		19	3	26		27	1	23	
4	5	49		12	4	49		20	3	13		28	1	5	
5	5	44		13	4	39		21	2	58		29	0	48	
6	5	38		14	4	28		22	2	43		30	0	30	
7	5	31		15	4	17		23	2	28		31	0	11	
8	5	24		16	4	5		24	2	12					

The times of High Water are given for Mean Time at Place ; if Greenwich r Railway Time be required—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
W.	1	9 41 36	7	9 59 36	0	0 41 15	8	1 4 15	5	1 44 10	7	2 6 10	5	20'3
Th.	2	10 18 35	3	10 37 34	5	1 28 15	2	1 53 14	11	2 28 10	4	2 52 10	2	21'3
F.	3	10 59 33	7	11 22 32	7	2 19 14	7	2 47 14	3	3 18 10	0	3 46 9	10	22'3
S.	4	11 49 31	9	—	—	3 18 13	11	3 52 13	8	4 16 9	8	4 50 9	9	23'3
M.	5	0 21 31	0	0 55 30	7	4 30 13	5	5 8 13	5	5 25 9	4	6 0 9	9	24'3
M.	6	1 34 30	6	2 14 30	9	5 46 13	6	6 23 13	8	6 33 9	4	7 9 9	9	25'3
Tu.	7	2 57 31	4	3 38 32	2	6 59 13	11	7 31 14	3	7 47 9	8	8 22 9	11	26'3
W.	8	4 18 33	0	4 55 34	2	8 3 14	7	8 32 15	0	8 56 10	1	9 29 10	3	27'3
Th.	9	5 28 35	3	5 57 36	2	8 58 15	4	9 22 15	8	9 58 10	6	10 21 10	8	28'3
F.	10	6 23 36	10	6 47 37	3	9 45 15	11	10 6 16	2	10 42 10	11	11 3 11	1	29'3
S.	11	7 10 37	8	7 32 38	0	10 26 16	3	10 45 16	4	11 23 11	2	11 44 11	2	30'9
M.	12	7 51 38	0	8 9 37	11	11 3 16	3	11 21 16	2	—	—	0 5 11	1	1'9
M.	13	8 27 37	7	8 45 37	4	11 40 16	0	12 0 15	10	0 24 11	0	0 43 10	11	2'9
Tu.	14	9 2 36	9	9 18 36	2	—	—	0 19 15	7	1 3 10	9	1 22 10	7	3'9
W.	15	9 34 35	5	9 49 34	6	0 38 15	4	0 58 14	11	1 41 10	5	1 59 10	2	4'9
Th.	16	10 4 33	7	10 19 32	7	1 18 14	6	1 38 14	2	2 18 10	0	2 37 9	9	5'9
F.	17	10 33 31	7	10 50 30	6	1 58 13	9	2 18 13	5	2 57 9	7	3 17 9	4	6'9
S.	18	11 11 29	6	11 36 28	7	2 41 13	0	3 8 12	8	3 40 9	2	4 7 8	11	7'9
M.	19	—	—	0 6 27	9	3 38 12	4	4 13 12	1	4 36 8	9	5 10 8	7	8'9
M.	20	0 39 27	3	1 16 27	1	4 51 12	0	5 30 12	0	5 44 8	6	6 18 8	6	9'9
Tu.	21	1 54 27	4	2 33 27	8	6 5 12	2	6 40 12	4	6 52 8	8	7 27 8	10	10'9
W.	22	3 12 28	5	3 47 29	4	7 13 12	8	7 41 13	0	8 0 9	0	8 31 9	3	11'9
Th.	23	4 21 30	5	4 49 31	7	8 7 13	6	8 29 13	11	9 0 9	5	9 25 9	8	12'9
F.	24	5 16 32	10	5 40 34	0	8 49 14	4	9 8 14	9	9 47 9	11	10 8 10	3	13'9
S.	25	6 3 35	1	6 27 36	1	9 27 15	3	9 47 15	7	10 26 10	11	10 44 10	9	14'9
M.	26	6 47 36	10	7 7 37	7	10 6 15	11	10 24 16	3	11 2 10	11	11 20 11	1	15'9
M.	27	7 27 38	3	7 47 38	8	10 41 16	5	10 59 16	7	11 40 11	2	12 0 11	3	16'9
Tu.	28	8 6 38	11	8 24 38	11	11 17 16	7	11 36 16	7	—	—	0 20 11	3	17'9
W.	29	8 43 38	10	9 2 38	6	11 58 16	5	—	—	0 40 11	1	1 1 11	2	18'9
Th.	30	9 21 38	0	9 40 37	3	0 20 16	4	0 43 16	1	1 23 11	0	1 44 10	10	19'9
F.	31	9 59 36	4	10 18 35	2	1 6 15	9	1 30 15	4	2 6 10	8	2 31 10	5	20'9

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2	Sub.	9	5	16	Sub.	17	3	53	Sub.	25	1	56	Sub.
2	5	59		10	5	7		18	3	40		26	1	40	
3	5	54		11	4	58		19	3	26		27	1	23	
4	5	49		12	4	49		20	3	13		28	1	5	
5	5	44		13	4	39		21	2	58		29	0	48	
6	5	38		14	4	28		22	2	43		30	0	30	
7	5	31		15	4	17		23	2	28		31	0	11	
8	5	24		16	4	5		24	2	12					

The given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	3m 37	1 20	9 4	1 44	9 3	10 44	7 2	11 6	7 0	8 8	10 5	8 30	10 2
Th.	2	4 28	2 8	9 2	2 33	9 1	11 33	6 10	—	—	8 53	9 11	9 21	9 8
F.	3	5 20	3 1	8 11	3 29	8 9	0 5	6 7	0 41	6 4	9 52	9 5	10 25	9 3
S.	4	6 14	4 0	8 8	4 32	8 6	1 19	6 2	1 59	6 1	11 1	9 1	11 37	8 11
♄.	5	7 10	5 6	8 5	5 40	8 4	2 42	6 0	3 18	6 2	—	—	0 13	8 11
M.	6	8 8	6 16	8 4	6 55	8 4	3 52	6 4	4 24	6 6	0 50	9 0	1 28	9 1
Tu.	7	9 7	7 33	8 5	8 6	8 7	4 54	6 8	5 21	6 10	2 5	9 3	2 38	9 6
W.	8	10 5	8 37	8 9	9 6	9 0	5 48	7 0	6 16	7 2	3 8	9 10	3 35	10 3
Th.	9	11 1	9 33	9 3	9 58	9 4	6 44	7 5	7 10	7 7	4 0	10 7	4 24	10 10
F.	10	11 55	10 21	9 5	10 42	9 6	7 34	7 8	7 56	7 9	4 47	11 1	5 10	11 4
S.	11	0a 46	11 3	9 7	11 23	9 7	8 16	7 11	8 36	7 11	5 32	11 5	5 53	11 6
♄.	12	1 35	11 41	9 6	11 59	9 6	8 54	7 10	9 11	7 9	6 11	11 5	6 30	11 4
M.	13	2 21	—	—	0 19	9 5	9 28	7 7	9 46	7 5	6 49	11 2	7 8	10 11
Tu.	14	3 6	0 39	9 5	0 57	9 4	10 2	7 3	10 20	7 2	7 26	10 8	7 44	10 4
W.	15	3 51	1 17	9 3	1 37	9 1	10 38	6 11	10 56	6 8	8 1	10 1	8 19	9 9
Th.	16	4 35	1 57	8 11	2 18	8 10	11 17	6 5	11 42	6 2	8 38	9 5	8 59	9 1
F.	17	5 20	2 40	8 8	3 1	8 6	—	—	0 8	5 11	9 22	8 10	9 47	8 6
S.	18	6 6	3 23	8 4	3 49	8 2	0 37	5 8	1 11	5 6	10 16	8 3	10 47	8 1
♄.	19	6 52	4 18	8 0	4 51	7 11	1 46	5 4	2 25	5 4	11 22	7 11	11 58	7 11
M.	20	7 40	5 25	7 10	6 0	7 10	3 2	5 4	3 37	5 6	—	—	0 34	7 11
Tu.	21	8 29	6 35	7 10	7 12	7 10	4 9	5 8	4 39	5 10	1 9	8 6	1 45	8 2
W.	22	9 19	7 47	8 0	8 16	8 2	5 8	6 0	5 31	6 3	2 20	8 5	2 48	8 8
Th.	23	10 9	8 41	8 4	9 3	8 7	5 52	6 5	6 13	6 7	3 12	9 0	3 33	9 5
F.	24	11 0	9 23	8 10	9 43	9 0	6 33	6 10	6 55	7 1	3 51	9 10	4 10	10 2
S.	25	11 50	10 3	9 2	10 22	9 4	7 15	7 3	7 37	7 6	4 29	10 7	4 49	10 11
♄.	26	morn.	10 41	9 6	10 59	9 7	7 56	7 8	8 14	7 10	5 9	11 2	5 29	11 5
M.	27	0 41	11 18	9 7	11 37	9 8	8 32	8 0	8 49	8 0	5 49	11 7	6 7	11 8
Tu.	28	1 32	11 55	9 8	—	—	9 6	8 0	9 25	7 11	6 25	11 8	6 45	11 7
W.	29	2 24	0 15	9 8	0 37	9 8	9 44	7 10	10 3	7 8	7 6	11 5	7 27	11 2
Th.	30	3 16	0 59	9 7	1 21	9 6	10 23	7 6	10 45	7 4	7 47	10 11	8 8	10 7
F.	31	4 11	1 45	9 5	2 11	9 3	11 9	7 1	11 40	6 9	8 32	10 3	8 57	9 11

Half Mean Spring } 4ft. 9in.
Range.

3ft. -10in.

5ft. 7in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	3	7	16	Afternoon.
New - - - -	10	2	36	Afternoon.
First Quarter -	18	9	16	Morning.
Full - - - -	26	3	34	Morning.
In Perigee - -	5	11	0	Afternoon.
In Apogee - -	18	11	0	Morning.
In Perigee - -	30	12	0	Midnight.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	3	N.10	9	15	N.16	17	12	8.58	25	10	8.28
2	7	22	10	12	23	18	15	21	26	6	42
3	11	12	11	8	53	19	17	4	27	2	30
4	14	25	12	5	1	20	18	4	28	1	N.53
5	16	47	13	1	1	21	18	14	29	6	13
6	18	6	14	2	8.55	22	17	34	30	10	12
7	18	17	15	6	39	23	16	1	31	13	36
8	17	18	16	10	2	24	13	37			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

AUGUST, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
W.	1	7	31	14	2	7	53	13	11	7	54	11	4	8	15	11	2	8	14	12	4	8	34	12	2	20.3
Th.	2	8	17	13	7	8	43	13	2	8	36	10	11	8	57	10	8	8	54	12	0	9	15	11	9	21.3
F.	3	9	11	12	9	9	39	12	4	9	22	10	5	9	47	10	2	9	37	11	6	10	3	11	3	(
S.	4	10	10	12	0	10	46	11	9	10	13	9	11	10	45	9	9	10	33	10	11	11	6	10	8	23.3
S.	5	11	23	11	9	—	—	—	—	11	21	9	8	12	0	9	8	11	40	10	6	—	—	—	—	24.3
M.	6	0	2	11	9	0	40	11	11	—	—	—	—	0	39	9	10	0	14	10	5	0	51	10	6	25.3
Tu.	7	1	17	12	3	1	49	12	8	1	21	10	0	2	0	10	3	1	30	10	8	2	9	11	0	26.3
W.	8	2	20	13	0	2	51	13	5	2	36	10	6	3	9	10	10	2	48	11	3	3	24	11	7	27.3
Th.	9	3	20	13	10	3	44	14	3	3	39	11	2	4	6	11	5	3	57	11	11	4	26	12	2	28.3
F.	10	4	7	14	7	4	29	14	10	4	30	11	8	4	53	11	10	4	53	12	4	5	16	12	5	●
S.	11	4	50	15	1	5	11	15	2	5	15	12	0	5	37	12	0	5	37	12	6	5	58	12	8	0.9
S.	12	5	31	15	2	5	51	15	1	5	58	12	0	6	18	11	11	6	19	12	8	6	38	12	8	1.9
M.	13	6	10	14	11	6	29	14	8	6	37	11	10	6	55	11	8	6	57	12	7	7	15	12	6	2.9
Tu.	14	6	47	14	5	7	6	14	1	7	12	11	6	7	30	11	3	7	33	12	4	7	51	12	2	3.9
W.	15	7	24	13	8	7	43	13	3	7	48	11	0	8	5	10	9	8	7	12	0	8	23	11	9	4.9
Th.	16	8	2	12	10	8	22	12	4	8	21	10	5	8	38	10	1	8	39	11	6	8	55	11	2	5.9
F.	17	8	42	11	10	9	4	11	4	8	55	9	10	9	15	9	6	9	11	10	10	9	29	10	7	6.9
S.	18	9	29	10	11	9	57	10	6	9	36	9	3	10	0	9	0	9	52	10	3	10	20	9	11)
S.	19	10	30	10	3	11	6	10	2	10	30	8	10	11	5	8	8	10	52	9	8	11	25	9	6	8.9
M.	20	11	46	10	2	—	—	—	—	11	42	8	8	—	—	—	—	11	59	9	4	—	—	—	—	9.9
Tu.	21	0	22	10	4	0	57	10	7	0	19	8	9	0	57	8	11	0	33	9	5	1	8	9	7	10.9
W.	22	1	31	10	11	1	59	11	4	1	36	9	1	2	9	9	4	1	44	9	10	2	18	10	1	11.9
Th.	23	2	24	11	10	2	47	12	3	2	39	9	8	3	4	10	0	2	51	10	5	3	19	10	9	12.9
F.	24	3	9	12	9	3	30	13	3	3	27	10	5	3	50	10	9	3	45	11	2	4	9	11	6	13.9
S.	25	3	50	13	9	4	10	14	3	4	12	11	1	4	33	11	5	4	33	11	10	4	56	12	11	14.9
S.	26	4	29	14	8	4	46	15	0	4	52	11	8	5	12	11	11	5	15	12	4	5	34	12	6	○
M.	27	5	6	15	3	5	26	15	6	5	33	12	1	5	53	12	2	5	54	12	8	6	14	12	10	16.9
Tu.	28	5	46	15	7	6	6	15	6	6	13	12	3	6	33	12	3	6	33	12	11	6	53	13	0	17.9
W.	29	6	27	15	5	6	48	15	3	6	53	12	2	7	13	12	0	7	14	12	11	7	34	12	10	18.9
Th.	30	7	9	14	11	7	31	14	7	7	33	11	10	7	54	11	7	7	54	12	9	8	14	12	7	19.9
F.	31	7	56	14	1	8	21	13	6	8	16	11	4	8	37	11	0	8	34	12	3	8	54	12	0	20.9

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	6	2	Sub.	9	5	16	Sub.	17	3	53	Sub.	25	1	56	Sub.
2	5	59		10	5	7		18	3	40		26	1	40	
3	5	54		11	4	58		19	3	26		27	1	23	
4	5	49		12	4	49		20	3	13		28	1	5	
5	5	44		13	4	39		21	2	58		29	0	48	
6	5	38		14	4	28		22	2	43		30	0	30	
7	5	31		15	4	17		23	2	28		31	0	11	
8	5	24		16	4	5		24	2	12					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
S.	1	5 m6	7 50 16 8	8 18 15 11	9 36 14 3	10 1 13 10	3 23 12 0	3 48 11 8						
S.	2	6 3	8 47 15 2	9 21 14 8	10 28 13 6	10 58 13 1	4 15 11 3	4 44 10 11						
M.	3	7 0	10 2 14 5	10 47 14 4	11 32 13 0	— —	5 15 10 7	5 54 10 4						
Tu.	4	7 57	11 33 14 6	— —	0 13 12 7	0 55 13 0	6 36 10 3	7 20 10 5						
W.	5	8 53	0 14 14 11	0 51 15 6	1 40 12 10	2 20 12 6	8 1 10 9	8 41 11 1						
Th.	6	9 46	1 24 16 2	1 51 16 10	2 58 13 5	3 32 14 4	9 15 11 5	9 45 11 9						
F.	7	10 38	2 17 17 7	2 39 18 2	4 1 14 2	4 27 15 1	10 12 12 0	10 35 12 4						
S.	8	11 27	3 0 18 9	3 21 19 1	4 51 14 9	5 14 15 7	10 56 12 6	11 17 12 8						
S.	9	0 a 14	3 40 19 4	3 58 19 5	5 35 15 3	5 55 15 10	11 36 12 9	11 54 12 10						
M.	10	1 0	4 16 19 5	4 34 19 4	6 14 15 5	6 33 15 10	— —	0 13 12 10						
Tu.	11	1 45	4 50 19 3	5 7 19 0	6 50 15 5	7 5 15 6	0 32 12 9	0 50 12 8						
W.	12	2 29	5 24 18 8	5 39 18 4	7 20 15 0	7 34 14 11	1 7 12 7	1 25 12 5						
Th.	13	3 14	5 55 17 11	6 11 17 6	7 49 14 6	8 6 14 2	1 41 12 3	1 55 12 1						
F.	14	3 59	6 27 16 11	6 44 16 3	8 19 13 10	8 31 13 6	2 11 11 11	2 28 11 8						
S.	15	4 45	7 3 15 7	7 23 14 11	8 45 13 2	9 3 12 9	2 45 11 4	3 3 11 1						
S.	16	5 32	7 44 14 2	8 9 13 7	9 22 12 6	9 42 11 11	3 22 10 9	3 42 10 5						
M.	17	6 20	8 37 13 1	9 10 12 9	10 8 11 11	10 37 11 5	4 6 10 2	4 33 9 10						
Tu.	18	7 9	9 49 12 8	10 32 12 8	11 7 11 8	11 46 11 2	5 4 9 7	5 41 9 6						
W.	19	7 58	11 13 12 11	11 53 13 5	— —	0 28 11 10	6 22 9 5	7 2 9 7						
Th.	20	8 48	— —	0 29 14 0	1 8 11 8	1 49 12 7	7 40 9 11	8 17 10 3						
F.	21	9 38	1 0 14 9	1 29 15 7	2 27 12 5	3 0 13 6	8 51 10 8	9 21 11 1						
S.	22	10 29	1 52 16 6	2 13 17 5	3 30 13 5	3 56 14 6	9 46 11 6	10 8 11 11						
S.	23	11 21	2 31 18 3	2 50 19 0	4 20 14 5	4 44 15 4	10 27 12 4	10 46 12 8						
M.	24	morn.	3 10 19 8	3 29 20 2	5 6 15 2	5 27 16 0	11 6 12 11	11 25 13 2						
Tu.	25	0 13	3 49 20 6	4 11 20 8	5 48 15 10	6 10 16 5	11 45 13 4	— —						
W.	26	1 7	4 32 20 9	4 53 20 9	6 32 16 3	6 53 16 5	0 7 13 5	0 30 13 6						
Th.	27	2 3	5 14 20 7	5 34 20 3	7 12 16 2	7 32 16 1	0 52 13 5	1 14 13 4						
F.	28	2 59	5 56 19 9	6 18 19 2	7 53 15 10	8 15 15 10	1 36 13 2	1 57 13 0						
S.	29	3 57	6 40 18 5	7 6 17 7	8 36 15 3	8 56 14 10	2 19 12 9	2 41 12 5						
S.	30	4 56	7 33 16 8	8 3 15 8	9 21 14 6	9 48 13 10	3 5 12 0	3 31 11 7						
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			
Phases of the Moon.			Moon's Declination at Noon.											
D. H. M.			M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 2 0 9 Morning.			1	16	N. 10	9	2	N. 28	17	18	S. 11	25	4	N. 43
New - - - - 9 2 14 Morning.			2	17	45	10	1	S. 30	18	17	49	26	8	57
First Quarter - 17 3 28 Morning.			3	18	13	11	5	19	19	16	37	27	12	39
Full - - - - 24 2 5 Afternoon.			4	17	34	12	8	50	20	14	35	28	15	33
			5	15	53	13	11	57	21	11	45	29	17	25
			6	13	19	14	14	31	22	8	13	30	18	10
In Apogee - - 15 6 0 Morning.			7	10	5	15	16	28	23	4	9	31		
In Perigee - - 27 2 0 Morning.			8	6	23	16	17	42	24	0	N. 15			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Brest add 18 m. | Devonport add 17 m. | Portsmouth add 4 m.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.		
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	D.								
S.	1	3	4	17	9	3	29	17	1	4	29	15	5	4	53	15	0	6	0	18	9	6	24	18	4	21	9	
M.	2	3	56	16	6	4	23	15	11	5	20	14	7	5	51	14	3	6	50	17	10	7	19	17	4			
Tu.	3	4	52	15	4	5	27	15	0	6	23	13	10	7	0	13	6	7	51	16	11	8	30	16	7	23	9	
W.	4	6	4	14	10	6	46	15	1	7	43	13	5	8	28	13	6	9	13	16	4	9	56	16	2	24	9	
Th.	5	7	27	15	6	8	6	16	0	9	11	13	9	9	51	14	1	10	38	16	4	11	19	16	6	25	9	
F.	6	8	39	16	6	9	8	17	0	10	27	14	5	10	58	14	9	11	53	16	10	—	—	—	—	—	26	9
S.	7	9	35	17	6	10	0	18	0	11	25	15	1	11	50	15	5	0	24	17	3	0	52	17	8	27	9	
S.	8	10	24	18	4	10	46	18	7	—	—	—	—	0	12	15	9	1	18	18	1	1	43	18	5	28	9	
M.	9	11	7	18	10	11	27	18	11	0	33	16	0	0	54	16	2	2	3	18	9	2	23	19	0			
Tu.	10	11	46	19	0	—	—	—	—	1	13	16	4	1	31	16	4	2	43	19	2	3	0	19	4	1	4	
W.	11	0	7	18	11	0	24	18	10	1	48	16	5	2	5	16	3	3	17	19	5	3	33	19	5	2	4	
Th.	12	0	42	18	8	1	1	18	6	2	22	16	2	2	38	16	0	3	50	19	4	4	8	19	2	3	4	
F.	13	1	18	18	3	1	35	17	11	2	54	15	10	3	9	15	7	4	23	19	0	4	39	18	9	4	4	
S.	14	1	51	17	7	2	9	17	2	3	24	15	4	3	40	15	1	4	54	18	6	5	11	18	3	5	4	
M.	15	2	27	16	8	2	44	16	2	3	57	14	9	4	15	14	4	5	28	17	11	5	46	17	6	6	4	
M.	16	3	3	15	8	3	23	15	2	4	33	14	0	4	53	13	7	6	5	17	2	6	25	16	9	7	4	
Tu.	17	3	47	14	8	4	11	14	2	5	16	13	3	5	43	12	11	6	47	16	3	7	12	15	11			
W.	18	4	40	13	9	5	14	13	7	6	13	12	8	6	49	12	6	7	42	15	8	8	17	15	5	9	4	
Th.	19	5	51	13	6	6	28	13	9	7	30	12	5	8	14	12	6	8	58	15	3	9	38	15	2	10	4	
F.	20	7	6	14	3	7	44	14	9	8	53	12	9	9	31	13	1	10	19	15	4	10	57	15	7	11	4	
S.	21	8	16	15	5	8	44	16	1	10	6	13	6	10	35	14	0	11	33	15	11	—	—	—	—	—	12	4
M.	22	9	9	16	9	9	31	17	5	11	3	14	5	11	26	14	11	0	3	16	5	0	29	16	10	13	4	
M.	23	9	52	18	0	10	13	18	7	11	46	15	4	—	—	—	0	51	17	5	1	13	17	11	14	4		
Tu.	24	10	35	19	1	10	56	19	6	0	5	15	8	0	23	16	2	1	35	18	5	1	56	18	11			
W.	25	11	18	19	9	11	40	20	0	0	43	16	6	1	2	16	9	2	13	19	4	2	32	19	9	16	4	
Th.	26	—	—	—	—	0	3	20	1	1	21	16	11	1	42	17	0	2	52	20	0	3	11	20	2	17	4	
F.	27	0	26	20	1	0	50	20	0	2	3	17	0	2	24	17	0	3	32	20	3	3	53	20	3	18	4	
S.	28	1	13	19	9	1	37	19	5	2	44	16	11	3	4	16	8	4	13	20	2	4	34	20	0	19	4	
M.	29	2	0	19	0	2	23	18	5	3	26	16	4	3	49	16	0	4	57	19	8	5	19	19	4	20	4	
S.	30	2	48	17	10	3	13	17	1	4	11	15	7	4	36	15	1	5	42	18	10	6	6	18	4	21	4	
Half Mean Spring } Range.		9ft. 4in.								8ft. 0in.								9ft. 7in.										

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	0	7		9	2	45		17	5	32		25	8	20	
2	0	26		10	3	6		18	5	53		26	8	41	
3	0	45		11	3	26		19	6	15		27	9	1	
4	1	5		12	3	47		20	6	36		28	9	21	
5	1	24		13	4	8		21	6	57		29	9	41	
6	1	44		14	4	29		22	7	18		30	10	0	
7	2	4		15	4	50		23	7	39		31			
8	2	25		16	5	11		24	8	0					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DORSET subtract 5 m. | SHREVESS subtract 3 m. | LONDON 0 m.

SEPTEMBER, 1866.																										
WEEK DAY. MONTH DAY. MOON'S TRANSIT.			HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
S.		H. M.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.						
S.	1	5m 6	3 46	11 1	4 9	10 10	10 29	19 5	10 58	18 9	7 25	13 2	7 52	12 9												
S.	2	6 3	4 34	10 7	5 3	10 4	11 31	18 2	—	—	8 23	12 4	8 55	11 11												
M.	3	7 0	5 33	10 2	6 7	10 0	0 7	17 7	0 45	17 1	9 31	11 7	10 13	11 5												
Tu.	4	7 57	6 50	9 11	7 36	10 0	1 23	16 10	2 2	16 10	10 54	11 4	11 35	11 6												
W.	5	8 53	8 19	10 1	8 58	10 4	2 41	17 2	3 19	17 9	—	—	0 11	11 13												
Th.	6	9 46	9 34	10 7	10 7	10 10	3 56	18 4	4 27	18 11	0 46	12 3	1 17	12 9												
F.	7	10 38	10 36	11 0	11 1	11 3	4 54	19 5	5 18	19 11	1 46	13 2	2 13	13 6												
S.	8	11 27	11 24	11 6	11 46	11 7	5 40	20 4	6 2	20 7	2 37	13 9	2 58	14 0												
S.	9	0a 14	—	—	0 7	11 8	6 24	20 10	6 44	21 1	3 17	14 3	3 36	14 3												
M.	10	1 0	0 26	11 9	0 43	11 9	7 2	21 2	7 20	21 3	3 53	14 7	4 10	14 8												
Tu.	11	1 45	1 1	11 9	1 20	11 8	7 39	21 1	7 55	21 0	4 28	14 7	4 45	14 6												
W.	12	2 29	1 37	11 6	1 53	11 5	8 11	20 10	8 28	20 7	5 1	14 4	5 18	14 1												
Th.	13	3 14	2 10	11 3	2 26	11 1	8 44	20 3	9 0	19 9	5 34	13 9	5 51	13 3												
F.	14	3 59	2 42	10 11	2 58	10 9	9 16	19 4	9 33	18 10	6 8	13 1	6 26	12 9												
S.	15	4 45	3 15	10 7	3 32	10 4	9 50	18 3	10 9	17 9	6 45	12 4	7 5	12 6												
S.	16	5 32	3 49	10 2	4 8	9 11	10 30	17 2	10 55	16 8	7 25	11 7	7 49	11 3												
M.	17	6 20	4 30	9 8	4 55	9 6	11 25	16 2	11 58	15 9	8 15	10 11	8 45	10 8												
Tu.	18	7 9	5 23	9 5	5 56	9 3	—	—	0 33	15 5	9 20	10 5	10 0	10 3												
W.	19	7 58	6 37	9 3	7 22	9 4	1 10	15 4	1 49	15 5	10 41	10 4	11 18	10 6												
Th.	20	8 48	8 1	9 6	8 38	9 9	2 25	15 9	3 0	16 3	11 52	10 10	—	—												
F.	21	9 38	9 13	10 0	9 43	10 3	3 34	17 0	4 4	17 8	0 25	11 4	0 54	11 10												
S.	22	10 29	10 12	10 7	10 37	10 11	4 32	18 5	4 55	19 1	1 22	12 4	1 47	12 10												
S.	23	11 21	10 57	11 2	11 17	11 6	5 14	19 9	5 33	20 4	2 9	13 4	2 29	13 10												
M.	24	morn.	11 37	11 9	11 57	11 11	5 52	20 11	6 13	21 4	2															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. **HULL** add 1 m. **SUNDERLAND** add 5 m.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
S.	1	7 26	12 1	7 56	11 7	6 23	15 0	6 51	14 5	0 15	11 10	0 43	11 4	21.9
S.	2	8 29	11 1	9 4	10 8	7 23	14 0	7 58	13 6	1 15	10 11	1 49	10 5	22.9
M.	3	9 42	10 5	10 25	10 4	8 35	13 2	9 19	13 0	2 26	10 1	3 11	9 11	23.9
Tu.	4	11 7	10 5	11 48	10 7	10 1	13 0	10 41	13 2	3 59	9 10	4 42	9 11	24.9
W.	5	—	—	0 25	10 10	11 18	13 6	11 53	13 10	5 20	10 1	5 54	10 6	25.9
Th.	6	0 58	11 2	1 27	11 6	—	—	0 21	14 3	6 22	11 0	6 46	11 7	26.9
F.	7	1 53	11 10	2 17	12 3	0 47	14 9	1 12	15 3	7 9	12 1	7 28	12 7	27.9
S.	8	2 39	12 8	2 59	13 0	1 35	15 9	1 56	16 1	7 46	13 0	8 4	13 4	28.9
S.	9	3 18	13 2	3 36	13 4	2 16	16 4	2 35	16 6	8 22	13 6	8 39	13 6	29.9
M.	10	3 54	13 5	4 12	13 6	2 51	16 7	3 8	16 7	8 56	13 6	9 14	13 5	30.9
Tu.	11	4 31	13 4	4 47	13 2	3 26	16 5	3 43	16 3	9 31	13 3	9 49	13 1	31.9
W.	12	5 4	13 0	5 21	12 9	3 59	16 1	4 16	15 10	10 6	12 10	10 22	12 6	32.9
Th.	13	5 38	12 6	5 55	12 3	4 33	15 7	4 49	15 3	10 39	12 2	10 57	11 10	33.9
F.	14	6 12	12 0	6 29	11 8	5 6	14 11	5 24	14 7	11 16	11 5	11 35	11 0	34.9
S.	15	6 47	11 4	7 6	10 11	5 43	14 2	6 3	13 9	11 54	10 6	—	—	35.9
S.	16	7 28	10 6	7 53	10 0	6 24	13 3	6 48	12 10	0 16	10 1	0 40	9 8	36.9
M.	17	8 22	9 8	8 54	9 5	7 17	12 5	7 48	12 1	1 7	9 4	1 39	9 0	37.9
Tu.	18	9 32	9 3	10 12	9 3	8 24	11 11	9 6	11 9	2 16	8 10	2 59	8 9	38.9
W.	19	10 53	9 4	11 31	9 7	9 48	11 11	10 24	12 1	3 45	8 9	4 24	8 10	39.9
Th.	20	—	—	0 6	9 11	10 59	12 5	11 32	12 10	5 1	9 1	5 34	9 6	40.9
F.	21	0 39	10 3	1 6	10 8	—	—	0 1	13 4	6 2	10 0	6 27	10 8	41.9
S.	22	1 32	11 2	1 54	11 8	0 26	13 10	0 48	14 6	6 47	11 4	7 5	12 0	42.9
S.	23	2 13	12 2	2 31	12 8	1 8	15 2	1 27	15 9	7 20	12 8	7 36	13 3	43.9
M.	24	2 49	13 2	3 8	13 6	1 46	16 3	2 5	16 8	7 54	13 8	8 12	14 1	44.9
Tu.	25	3 26	13 10	3 45	14 1	2 24	17 1	2 42	17 4	8 30	14 3	8 50	14 4	45.9
W.	26	4 6	14 3	4 28	14 3	3 2	17 5	3 23	17 5	9 11	14 5	9 33	14 3	46.9
Th.	27	4 49	14 1	5 11	13 11	3 44	17 3	4 6	17 1	9 55	14 1	10 18	13 10	47.9
F.	28	5 33	13 9	5 57	13 5	4 28	16 10	4 51	16 6	10 42	13 5	11 6	13 0	48.9
S.	29	6 20	13 1	6 43	12 8	5 14	16 2	5 38	15 8	11 31	12 5	11 57	11 11	49.9
S.	30	7 9	12 2	7 39	11 7	6 5	15 1	6 34	14 5	—	—	0 26	11 4	50.9

Half Mean Spring } 6ft. 8in.

Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	0	7		9	2	45		17	5	32		25	8	20	
2	0	26		10	3	6		18	5	53		26	8	41	
3	0	45		11	3	26		19	6	15		27	9	1	
4	1	5		12	3	47		20	6	36		28	9	21	
5	1	24		13	4	8		21	6	57		29	9	41	
6	1	44		14	4	29		22	7	18		30	10	0	
7	2	4		15	4	50		23	7	39					
8	2	25		16	5	11		24	8	0					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
S.	1	5 m6	3 46	9 6	4 12	9 3	2 57	24 2	3 23	23 4	10 10	18 9	10 35	18 1	
S.	2	6 3	4 39	9 1	5 8	8 10	3 51	22 6	4 23	21 8	11 0	17 3	11 28	16 8	
M.	3	7 0	5 41	8 8	6 20	8 6	4 59	21 1	5 43	20 9	—	—	0 3	16 2	
Tu.	4	7 57	7 2	8 4	7 45	8 5	6 31	20 10	7 15	21 1	0 43	16 1	1 32	16 2	
W.	5	8 53	8 26	8 7	9 3	8 9	7 54	21 8	8 30	22 4	2 16	16 8	2 57	17 4	
Th.	6	9 46	9 37	8 11	10 6	9 1	9 0	23 1	9 27	23 10	3 32	18 1	4 4	18 9	
F.	7	10 38	10 32	9 3	10 57	9 5	9 52	24 6	10 14	25 1	4 34	19 5	5 0	20 0	
S.	8	11 27	11 20	9 6	11 42	9 7	10 35	25 6	10 55	25 10	5 25	20 6	5 47	20 10	
S.	9	0 2 14	—	—	0 3	9 9	11 15	26 2	11 33	26 4	6 7	21 1	6 25	21 3	
M.	10	1 0	0 22	9 9	0 40	9 10	11 52	26 5	—	—	6 42	21 5	7 0	21 4	
Tu.	11	1 45	1 0	9 10	1 17	9 9	0 11	26 4	0 28	26 2	7 17	21 2	7 34	20 11	
W.	12	2 29	1 33	9 9	1 50	9 8	0 45	25 11	1 12	25 7	7 51	20 7	8 6	20 3	
Th.	13	3 14	2 6	9 7	2 21	9 6	1 16	25 2	1 31	24 7	8 22	19 10	8 38	19 5	
F.	14	3 59	2 36	9 4	2 52	9 2	1 47	24 0	2 3	23 5	8 55	18 10	9 11	18 2	
S.	15	4 45	3 9	9 0	3 26	8 11	2 20	22 9	2 36	22 1	9 27	17 7	9 44	17 0	
S.	16	5 32	3 45	8 9	4 6	8 6	2 56	21 4	3 18	20 7	10 3	16 4	10 25	15 9	
M.	17	6 20	4 30	8 4	4 58	8 2	3 43	19 11	4 13	19 4	10 48	15 2	11 16	14 8	
Tu.	18	7 9	5 30	8 0	6 7	7 11	4 48	18 11	5 30	18 10	11 50	14 5	—	—	
W.	19	7 58	6 48	7 10	7 27	7 11	6 16	19 0	6 57	19 5	0 29	14 5	1 11	14 8	
Th.	20	8 48	8 5	8 1	8 41	8 3	7 34	19 11	8 9	20 8	1 54	15 1	2 33	15 9	
F.	21	9 38	9 13	8 6	9 42	8 9	8 38	21 6	9 5	22 5	3 7	16 7	3 38	17 6	
S.	22	10 29	10 7	9 0	10 28	9 3	9 28	23 5	9 48	24 4	4 5	18 5	4 30	19 3	
S.	23	11 21	10 49	9 5	11 10	9 7	10 5	25 2	10 24	25 10	4 52	20 1	5 14	20 9	
M.	24	morn.	11 32	9 9	11 52	10 0	10 44	26 5	11 4	27 1	5 36	21 4	5 56	21 11	
Tu.	25	0 13	—	—	0 13	10 2	11 24	27 6	11 46	27 9	6 16	22 4	6 37	22 7	
W.	26	1 7	0 34	10 3	0 57	10 3	—	—	0 8	27 11	6 58	22 9	7 19	22 8	
Th.	27	2 3	1 19	10 3	1 40	10 3	0 29	27 11	0 50	27 9	7 40	22 6	8 1	22 2	
F.	28	2 59	2 1	10 2	2 23	10 1	1 11	27 3	1 33	26 8	8 42	21 8	8 46	21 1	
S.	29	3 57	2 44	9 11	3 5	9 8	1 55	26 0	2 17	25 2	9 8	20 4	9 31	19 7	
S.	30	4 56	3 29	9 6	3 55	9 3	2 40	24 3	3 6	23 4	9 54	18 9	10 20	17 10	
Half Mean Spring } Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 2 0 9 Morning.							1	16	N. 10	9	2	N. 28	17	18	S. 11
New - - - - 9 2 14 Morning.							2	17	45	10	18	30	18	17	49
First Quarter - 17 3 28 Morning.							3	18	13	11	5	19	19	16	37
Full - - - - 24 2 5 Afternoon.							4	17	34	12	8	50	20	14	35
							5	15	53	13	11	57	21	11	45
In Apogee - - 15 6 0 Morning.							6	13	19	14	14	31	22	8	13
In Perigee - - 27 2 0 Morning.							7	10	5	15	16	28	23	4	9
							8	6	23	16	17	42	24	0	N. 15

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		D.
S.	1	10 39 33 11	11 3 32 9	1 56 14 10	2 24 14 5	2 56 10 2	3 23 9 11	21 9						
S.	2	11 30 31 5	— —	2 56 13 11	3 29 13 6	3 54 9 8	4 28 9 5	11						
M.	3	0 1 30 5	0 39 29 9	4 7 13 2	4 52 13 0	5 5 9 2	5 43 9 1	23 9						
Tu.	4	1 22 29 7	2 7 29 9	5 34 13 1	6 15 13 3	6 22 9 1	7 2 9 3	24 9						
W.	5	2 49 30 5	3 31 31 4	6 52 13 6	7 26 13 10	7 39 9 5	8 16 9 8	25 9						
Th.	6	4 10 32 5	4 44 33 6	7 56 14 4	8 23 14 9	8 49 9 11	9 19 10 2	26 9						
F.	7	5 15 34 7	5 41 35 7	8 47 15 1	9 8 15 6	9 46 10 4	10 8 10 7	27 9						
S.	8	6 6 36 4	6 29 36 11	9 29 15 9	9 49 16 0	10 27 10 9	10 46 10 11	28 9						
S.	9	6 49 37 4	7 8 37 7	10 8 16 2	10 24 16 3	11 5 11 1	11 22 11 1	●						
M.	10	7 26 37 10	7 44 37 9	10 40 16 3	10 56 16 2	11 39 11 1	11 58 11 0	1 4						
Tu.	11	8 1 37 6	8 17 37 3	11 12 16 1	11 29 15 11	— —	0 15 10 11	2 4						
W.	12	8 33 36 10	8 48 36 4	11 47 15 8	— —	0 33 10 10	0 51 10 8	3 4						
Th.	13	9 2 35 9	9 16 35 0	0 4 15 5	0 21 15 1	1 8 10 6	1 24 11 4	4 4						
F.	14	9 31 34 2	9 45 33 2	0 39 14 10	0 58 14 5	1 40 10 1	1 58 9 11	5 4						
S.	15	9 59 32 2	10 14 31 11	1 17 14 0	1 36 13 7	2 17 9 8	2 36 9 6	6 4						
S.	16	10 31 29 11	10 52 28 11	1 57 13 2	2 21 12 9	2 56 9 3	3 19 9 0	7 4						
M.	17	11 18 28 0	11 50 27 4	2 48 12 5	3 20 12 1	3 47 8 9	4 18 8 7	11						
Tu.	18	— —	0 26 26 10	3 57 11 11	4 39 11 10	4 54 8 6	5 30 8 5	9 4						
W.	19	1 8 26 11	1 48 27 3	5 21 11 11	5 58 12 2	6 9 8 6	6 45 8 8	10 4						
Th.	20	2 27 27 11	3 5 28 11	6 33 12 6	7 6 12 11	7 20 8 10	7 54 9 11	11 4						
F.	21	3 42 30 1	4 16 31 5	7 34 13 4	8 1 13 11	8 25 9 5	8 54 9 8	12 4						
S.	22	4 45 32 11	5 11 34 4	8 24 14 6	8 43 15 0	9 20 10 0	9 42 10 4	13 4						
S.	23	5 33 35 8	5 55 36 10	9 0 15 6	9 19 15 11	10 0 10 7	10 18 10 11	14 4						
M.	24	6 17 37 9	6 38 38 7	9 38 16 4	9 57 16 8	10 36 11 2	10 54 11 4	15						
Tu.	25	6 59 39 4	7 21 39 11	10 15 16 11	10 34 17 11	11 13 11 6	11 33 11 7	16 4						
W.	26	7 42 40 0	8 3 40 0	10 54 17 2	11 14 17 11	11 55 11 7	— —	17 4						
Th.	27	8 23 39 10	8 43 39 4	11 36 17 0	11 59 16 9	0 17 11 6	0 39 11 5	18 4						
F.	28	9 3 38 8	9 23 37 10	— —	0 23 16 5	1 2 11 3	1 25 11 0	19 4						
S.	29	9 43 36 8	10 3 35 4	0 48 16 0	1 13 15 5	1 49 10 9	2 13 10 6	20 4						
S.	30	10 24 33 11	10 48 32 5	1 39 14 11	2 7 14 5	2 39 10 2	3 6 9 11	21 4						
Half Mean Spring } Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	0 7	Add.	9	2 45	Add.	17	5 32	Add.	25	8 20	Add.
2	0 26		10	3 6		18	5 33		26	8 41	
3	0 45		11	3 26		19	6 15		27	9 1	
4	1 5		12	3 47		20	6 36		28	9 21	
5	1 24		13	4 8		21	6 57		29	9 41	
6	1 44		14	4 29		22	7 18		30	10 0	
7	2 4		15	4 50		23	7 39				
8	2 25		16	5 11		24	8 0				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
S.	1	5 m6	2 38	9 1	3 7	8 10	—	—	0 14	6 5	9 28	9 7	10 2	9 3
S.	2	6 3	3 38	8 8	4 10	8 6	0 54	6 2	1 35	6 0	10 38	8 11	11 17	8 9
M.	3	7 0	4 46	8 4	5 25	8 3	2 19	5 11	3 2	5 11	11 57	8 8	—	—
Tu.	4	7 57	6 4	8 2	6 47	8 2	3 41	6 1	4 18	6 4	0 38	8 8	1 20	8 9
W.	5	8 53	7 26	8 3	8 1	8 5	4 48	6 6	5 16	6 8	1 58	9 0	2 33	9 4
Th.	6	9 46	8 30	8 8	8 57	8 11	5 42	6 10	6 7	7 1	3 1	9 8	3 26	10 0
F.	7	10 38	9 22	9 1	9 44	9 3	6 32	7 3	6 56	7 5	3 49	10 4	4 10	10 8
S.	8	11 27	10 5	9 5	10 25	9 6	7 18	7 7	7 39	7 8	4 31	11 0	4 52	11 2
S.	9	0a 14	10 44	9 6	11 1	9 7	7 58	7 9	8 14	7 10	5 12	11 4	5 30	11 5
M.	10	1 0	11 18	9 6	11 35	9 5	8 30	7 11	8 46	7 10	5 47	11 5	6 4	11 4
Tu.	11	1 45	11 50	9 5	—	—	9 2	7 8	9 18	7 6	6 20	11 3	6 38	11 1
W.	12	2 29	0 8	9 5	0 25	9 4	9 34	7 4	9 49	7 2	6 56	10 10	7 12	10 7
Th.	13	3 14	0 43	9 3	1 0	9 2	10 3	7 0	10 19	6 10	7 27	10 3	7 43	9 11
F.	14	3 59	1 18	9 0	1 37	8 11	10 36	6 7	10 56	6 4	7 59	9 7	8 17	9 3
S.	15	4 45	1 58	8 9	2 18	8 7	11 19	6 1	11 45	5 9	8 37	9 0	9 0	8 8
S.	16	5 32	2 39	8 5	3 3	8 3	—	—	0 16	5 6	9 26	8 4	9 56	8 1
M.	17	6 20	3 30	8 1	4 0	8 0	0 50	5 4	1 27	5 3	10 29	7 11	11 6	7 10
Tu.	18	7 9	4 35	7 11	5 12	7 10	2 9	5 2	2 49	5 3	11 45	7 9	—	—
W.	19	7 58	5 51	7 9	6 29	7 10	3 28	5 5	4 2	5 8	0 25	7 10	1 3	8 0
Th.	20	8 48	7 6	7 11	7 40	8 1	4 32	5 11	5 0	6 1	1 39	8 2	2 13	8 6
F.	21	9 38	8 9	8 3	8 35	8 6	5 24	6 4	5 46	6 8	2 41	8 11	3 6	9 4
S.	22	10 29	8 58	8 10	9 18	9 1	6 8	6 11	6 28	7 2	3 27	9 10	3 45	10 3
S.	23	11 21	9 36	9 3	9 55	9 5	6 48	7 5	7 8	7 8	4 2	10 9	4 21	11 1
M.	24	morn.	10 14	9 7	10 33	9 9	7 29	7 11	7 47	8 1	4 41	11 5	5 1	11 9
Tu.	25	0 13	10 52	9 10	11 12	9 10	8 5	8 3	8 24	8 4	5 21	11 11	5 42	12 1
W.	26	1 7	11 32	9 10	11 52	9 10	8 44	8 4	9 4	8 3	6 2	12 1	6 23	12 0
Th.	27	2 3	—	—	0 15	9 10	9 24	8 1	9 44	7 11	6 45	11 9	7 7	11 6
F.	28	2 59	0 38	9 9	1 2	9 7	10 5	7 8	10 27	7 6	7 29	11 2	7 51	10 10
S.	29	3 57	1 27	9 5	1 53	9 3	10 50	7 2	11 21	6 10	8 14	10 4	8 40	9 11
S.	30	4 56	2 21	9 1	2 50	8 10	11 56	6 5	—	—	9 10	9 6	9 47	9 1
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			

Phases of the Moon.

	D.	H.	M.	
Last Quarter-	2	0	9	Morning.
New - - - - -	9	2	14	Morning.
First Quarter	17	3	28	Morning.
Full - - - - -	24	2	5	Afternoon.
In Apogee - -	15	6	0	Morning.
In Perigee - -	27	2	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	16	N. 10	9	2	N. 28	17	18	S. 11	25	4	N. 43
2	17	45	10	18	30	18	17	49	26	8	57
3	18	13	11	5	19	19	16	37	27	12	39
4	17	34	12	8	50	20	14	35	28	15	33
5	15	53	13	11	57	21	11	45	29	17	25
6	13	19	14	14	31	22	8	13	30	18	10
7	10	5	15	16	28	23	4	9			
8	6	23	16	17	42	24	0	N. 15			

The times of High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

SEPTEMBER, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.
S.	1	8 48	12 11	9 18	12 4	9 10	7	9 27	10 3	9 17	11 7	9 42	11 3	21.9
M.	2	9 49	11 10	10 25	11 6	9 54	9 11	10 26	7	10 12	10 10	10 47	10 6	D
Tu.	3	11 7	11 4	11 50	11 4	11 5	9 5	11 48	9 4	11 25	10 3	—	—	23.9
W.	4	—	—	0 32	11 6	—	—	0 31	9 6	0 3	10 1	0 43	10 3	24.9
Th.	5	1 10	11 10	1 44	12 3	1 12	9 8	1 53	9 11	1 22	10 5	2 1	10 11	25.5
F.	6	2 13	12 9	2 41	13 2	2 28	10 3	2 58	10 7	2 39	11 0	3 13	11 4	26.9
S.	7	3 8	13 7	3 30	14 0	3 26	10 11	3 51	11 3	3 44	11 8	4 10	12 0	27.9
M.	8	3 51	14 4	4 12	14 8	4 14	11 6	4 35	11 8	4 35	12 2	4 58	12 4	28.9
Tu.	9	4 31	14 10	4 48	15 0	4 55	11 10	5 14	11 11	5 18	12 5	5 35	12 6	●
W.	10	5 6	15 1	5 25	15 0	5 33	11 11	5 52	11 11	5 53	12 7	6 12	12 7	1.4
Th.	11	5 42	14 11	5 59	14 9	6 9	11 10	6 26	11 9	6 29	12 6	6 46	12 5	2.4
F.	12	6 16	14 6	6 32	14 3	6 43	11 7	6 58	11 5	7 3	12 4	7 19	12 2	3.4
S.	13	6 49	13 10	7 5	13 6	7 14	11 2	7 30	10 11	7 34	12 0	7 49	11 10	4.4
M.	14	7 23	13 1	7 42	12 8	7 46	10 8	8 2	10 4	8 5	11 7	8 20	11 4	5.4
Tu.	15	8 1	12 2	8 21	11 7	8 17	10 0	8 35	9 8	8 35	11 0	8 51	10 9	6.4
W.	16	8 44	11 1	9 9	10 7	8 55	9 4	9 17	9 1	9 9	10 5	9 33	10 1	7.4
Th.	17	9 39	10 3	10 14	10 1	9 42	8 10	10 14	8 8	10 2	9 10	10 36	9 6	D
F.	18	10 54	10 0	11 37	10 11	10 52	8 7	11 34	8 7	11 12	9 4	11 50	9 11	9.4
S.	19	—	—	0 15	10 4	—	—	0 13	8 8	—	—	0 26	9 5	10.4
M.	20	0 51	10 8	1 24	11 2	0 51	8 11	1 28	9 3	1 2	8	1 38	9 11	11.4
Tu.	21	1 52	11 8	2 18	12 3	2 3	9 7	2 34	10 0	2 13	10 4	2 46	10 9	12.4
W.	22	2 42	12 11	3 4	13 6	2 59	10 5	3 22	10 10	3 14	11 2	3 40	11 7	13.4
Th.	23	3 22	14 0	3 41	14 6	3 43	11 3	4 4	11 7	4 3	12 0	4 25	12 4	14.4
F.	24	4 1	15 0	4 20	15 6	4 25	11 11	4 44	11 3	4 48	12 7	5 8	12 10	○
S.	25	4 39	15 10	5 0	16 0	5 5	12 5	5 27	12 7	5 26	13 0	5 46	13 11	16.4
M.	26	5 22	16 1	5 44	16 1	5 49	12 7	6 11	12 7	6 9	13 3	6 31	13 3	17.3
Tu.	27	6 6	15 11	6 28	15 7	6 32	12 6	6 53	12 4	6 53	13 3	7 14	13 1	18.4
W.	28	6 51	15 3	7 14	14 10	7 15	12 1	7 37	11 9	7 36	12 11	7 57	12 9	19.4
Th.	29	7 38	14 3	8 4	13 8	7 58	11 5	8 20	11 0	8 18	12 5	8 39	12 0	20.4
F.	30	8 31	12 11	9 3	12 2	8 44	10 7	9 12	10 2	9 2	11 7	9 27	11 2	21.4
Half Mean Spring Range.		7ft. 5in.				5ft 10in.				6ft. 2in.				

Half Mean Spring } 7ft. 5in.
Range.

5ft 10in.

6ft. 2in.

Equation of Time at Noon.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	5m53	8 34	15 0	9 10	14 5	10 15	13 8	10 47	12 11	4 0	11 2	4 29	10 10
Tu.	2	6 49	9 51	14 2	10 37	14 1	11 20	13 0	—	—	5 4	10 6	5 43	10 3
W.	3	7 42	11 22	14 3	—	—	0 1	12 5	0 44	12 11	6 26	10 2	7 10	10 3
Th.	4	8 34	0 5	14 8	0 39	15 2	1 27	12 7	2 7	13 5	7 52	10 7	8 29	10 11
F.	5	9 22	1 9	15 10	1 36	16 6	2 41	13 2	3 14	14 2	9 0	11 3	9 28	11 7
S.	6	10 9	1 57	17 1	2 18	17 8	3 40	13 11	4 5	14 10	9 52	11 10	10 13	12 1
S.	7	10 55	2 37	18 3	2 55	18 8	4 29	14 7	4 50	15 3	10 32	12 3	10 51	12 5
M.	8	11 40	3 14	18 11	3 31	19 0	5 10	15 1	5 28	15 7	11 9	12 6	11 27	12 7
Tu.	9	0a24	3 49	19 1	4 6	19 1	5 46	15 4	6 3	15 6	11 45	12 8	—	—
W.	10	1 9	4 23	18 11	4 38	18 9	6 20	15 4	6 36	15 3	0 3	12 8	0 21	12 7
Th.	11	1 54	4 53	18 7	5 9	18 3	6 49	15 0	7 2	14 10	0 38	12 5	0 54	12 4
F.	12	2 40	5 24	17 11	5 40	17 6	7 17	14 7	7 32	14 3	1 10	12 2	1 26	12 1
S.	13	3 26	5 57	17 1	6 14	16 6	7 47	14 0	8 3	13 7	1 42	11 10	1 58	11 8
S.	14	4 14	6 32	15 11	6 52	15 3	8 17	13 5	8 33	12 10	2 15	11 5	2 33	11 2
M.	15	5 1	7 14	14 8	7 36	14 1	8 50	12 10	9 11	12 1	2 52	10 11	3 13	10 8
Tu.	16	5 49	7 58	13 6	8 28	13 2	9 34	12 3	10 0	11 7	3 34	10 5	3 57	10 1
W.	17	6 38	9 3	12 11	9 43	12 10	10 29	11 11	11 2	11 3	4 24	9 10	4 57	9 8
Th.	18	7 27	10 26	13 0	11 10	13 5	11 42	12 0	—	—	5 35	9 7	6 15	9 7
F.	19	8 16	11 47	14 0	—	—	0 25	11 7	1 10	12 7	6 58	9 10	7 34	10 3
S.	20	9 6	0 21	14 9	0 48	15 6	1 47	12 5	2 23	13 5	8 9	10 8	8 39	11 1
S.	21	9 58	1 14	16 5	1 37	17 4	2 54	13 6	3 21	14 6	9 7	11 6	9 31	12 0
M.	22	10 51	1 59	18 3	2 20	19 1	3 48	14 6	4 13	15 5	9 54	12 5	10 16	12 9
Tu.	23	11 47	2 40	19 9	3 1	20 4	4 37	15 5	5 0	16 11	10 36	13 0	10 57	13 3
W.	24	morn.	3 23	20 9	3 46	20 11	5 22	16 1	5 45	16 5	11 19	13 6	11 42	13 7
Th.	25	0 45	4 9	21 0	4 31	20 11	6 8	16 5	6 31	16 6	—	—	0 6	13 7
F.	26	1 44	4 54	20 9	5 16	20 5	6 52	16 5	7 14	16 3	0 30	13 6	0 54	13 5
S.	27	2 45	5 39	19 11	6 3	19 4	7 36	16 1	7 59	15 8	1 17	13 4	1 40	13 1
S.	28	3 45	6 28	18 6	6 54	17 7	8 22	15 6	8 45	14 10	2 4	12 9	2 29	12 5
M.	29	4 43	7 22	16 9	7 50	15 10	9 9	14 9	9 35	13 10	2 55	12 1	3 22	11 8
Tu.	30	5 39	8 21	15 1	8 54	14 7	10 1	13 9	10 32	12 10	3 49	11 3	4 18	10 11
W.	31	6 31	9 33	14 3	10 14	14 2	11 5	12 11	11 44	12 4	4 50	10 6	5 26	10 3
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D. ° '							
Last Quarter - 1 6 9 Morning.							1 17 N.46 9 7 S.47 17 15 S.28 25 14 N.36							
New - - - - - 8 4 58 Afternoon.							2 16 19 10 11 2 18 12 59 26 16 58							
First Quarter 16 9 24 Afternoon.							3 13 59 11 13 48 19 9 47 27 18 8							
Full - - - - - 24 0 12 Morning.							4 10 57 12 15 57 20 5 59 28 18 4							
Last Quarter 30 2 45 Afternoon.							5 7 25 13 17 25 21 1 44 29 16 52							
							6 3 36 14 18 8 22 2 N.45 30 14 41							
In Apogee - - 12 12 0 Midnight.							7 0 S.19 15 18 4 23 7 12 31 11 46							
In Perigee - - 25 5 0 Morning.							8 4 10 16 17 10 24 11 15							

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	D.								
M.	1	3 40 16 4	4 10 15 9	5 3 14 8	5 35 14 2	6 34 17 10	7 5 17 3	(
Tu.	2	4 41 15 2	5 16 14 9	6 10 13 9	6 49 13 5	7 39 16 10	8 18 16 5	23.4																		
W.	3	5 54 14 8	6 36 14 10	7 32 13 3	8 18 13 4	9 2 16 2	9 45 16 0	24.4																		
Th.	4	7 18 15 3	7 54 15 9	9 1 13 7	9 42 13 11	10 27 16 2	11 8 16 4	25.4																		
F.	5	8 24 16 3	8 51 16 9	10 15 14 3	10 43 14 7	11 42 16 8	—	26.4																		
S.	6	9 15 17 2	9 38 17 7	11 9 14 11	11 30 15 2	0 11 17 0	0 36 17 5	27.4																		
S.	7	9 58 18 0	10 19 18 3	11 51 15 6	—	—	1 0 17 10	28.4																		
M.	8	10 38 18 5	10 58 18 7	0 10 15 9	0 28 15 11	1 40 18 5	1 58 18 8	29.4																		
Tu.	9	11 18 18 8	11 37 18 8	0 46 16 0	1 4 16 2	2 17 18 10	2 34 19 0	0.8																		
W.	10	11 55 18 7	—	1 21 16 2	1 38 16 1	2 51 19 1	3 7 19 2	1.8																		
Th.	11	0 12 18 6	0 29 18 4	1 54 16 0	2 10 15 11	3 24 19 1	3 39 19 0	2.8																		
F.	12	0 47 18 1	1 4 17 10	2 25 15 9	2 39 15 7	3 55 18 11	4 11 18 9	3.8																		
S.	13	1 21 17 7	1 38 17 3	2 54 15 4	3 10 15 1	4 25 18 6	4 42 18 3	4.8																		
S.	14	1 56 16 10	2 14 16 5	3 27 14 10	3 44 14 6	4 59 18 0	5 16 17 8	5.8																		
M.	15	2 33 15 11	2 54 15 6	4 2 14 2	4 22 13 10	5 33 17 4	5 53 16 11	6.8																		
Tu.	16	3 15 15 1	3 37 14 7	4 44 13 6	5 8 13 2	6 15 16 6	6 38 16 3	7.8																		
W.	17	4 2 14 2	4 33 13 10	5 34 12 11	6 5 12 8	7 3 15 11	7 36 15 8	8.8																		
Th.	18	5 8 13 9	5 45 13 10	6 42 12 6	7 24 12 7	8 12 15 6	8 52 15 5	9.8																		
F.	19	6 24 14 2	7 0 14 8	8 7 12 9	8 49 13 1	9 32 15 5	10 12 15 8	10.8																		
S.	20	7 36 15 5	8 4 16 1	9 25 13 6	9 57 13 11	10 50 16 0	11 23 16 5	11.8																		
S.	21	8 30 16 9	8 54 17 5	10 24 14 5	10 48 14 11	11 32 16 11	—	12.8																		
M.	22	9 17 18 1	9 40 18 8	11 10 15 4	11 32 15 10	0 17 17 5	0 40 18 0	13.8																		
Tu.	23	10 3 19 2	10 25 19 7	11 53 16 3	—	—	1 24 19 0	14.8																		
W.	24	10 50 19 11	11 15 20 2	0 13 16 7	0 34 16 10	1 45 19 5	2 7 19 9	15.8																		
Th.	25	11 40 20 3	—	0 56 17 1	1 19 17 2	2 28 20 1	2 50 20 3	16.8																		
F.	26	0 5 20 3	0 29 20 1	1 41 17 3	2 3 17 1	3 11 20 5	3 32 20 5	17.8																		
S.	27	0 54 19 11	1 19 19 6	2 24 17 0	2 46 16 11	3 55 20 3	4 16 20 1	18.8																		
S.	28	1 44 19 1	2 10 18 6	3 9 16 6	3 33 16 1	4 40 19 9	5 3 19 4	19.8																		
M.	29	2 37 17 10	3 3 17 2	3 58 15 8	4 25 15 2	5 29 18 11	5 55 18 5	20.8																		
Tu.	30	3 30 16 6	3 58 15 10	4 53 14 8	5 22 14 2	6 22 17 10	6 51 17 4	21.8																		
W.	31	4 27 15 3	5 0 14 11	5 56 13 10	6 33 13 5	7 25 16 11	8 1 16 6	22.8																		
Half Mean Spring } Range.		9ft. 4in.								8ft. 0in.								9ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	20		9	12	41		17	14	34		25	15	50	
2	10	39		10	12	57		18	14	45		26	15	56	
3	10	57		11	13	12		19	14	57		27	16	2	
4	11	15		12	13	27		20	15	7		28	16	6	
5	11	33		13	13	41		21	15	17		29	16	11	
6	11	51		14	13	55		22	15	26		30	16	14	
7	12	8		15	14	9		23	15	35		31	16	16	
8	12	25		16	14	22		24	15	42					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.								
M.	1	5m53	4 17 10 7	4 48 10 3	11 15 18 0	11 54 17 4	8 8 12 2	8 43 11 9																		
Tu.	2	6 49	5 20 10 1	5 56 9 11	— —	0 33 16 11	9 20 11 5	10 2 11 3																		
W.	3	7 42	6 39 9 10	7 26 9 11	1 12 16 7	1 52 16 7	10 44 11 2	11 26 11 4																		
Th.	4	8 34	8 9 10 0	8 49 10 2	2 32 16 11	3 10 17 6	— —	0 2 11 8																		
F.	5	9 22	9 22 10 5	9 52 10 8	3 44 18 1	4 12 18 7	0 34 12 1	1 2 12 6																		
S.	6	10 9	10 19 10 11	10 41 11 1	4 38 19 1	4 59 19 7	1 29 12 11	1 53 13 3																		
S.	7	10 55	11 2 11 3	11 22 11 6	5 19 20 0	5 38 20 3	2 15 13 6	2 34 13 9																		
M.	8	11 40	11 41 11 7	11 59 11 7	5 57 20 6	6 16 20 8	2 53 14 0	3 10 14 2																		
Tu.	9	0a24	— —	0 17 11 8	6 35 20 9	6 53 20 10	3 27 14 3	3 44 14 4																		
W.	10	1 9	0 34 11 7	0 51 11 7	7 10 20 10	7 27 20 9	4 1 14 5	4 18 14 4																		
Th.	11	1 54	1 8 11 6	1 24 11 4	7 43 20 7	7 58 20 5	4 33 14 3	4 47 14 1																		
F.	12	2 40	1 40 11 3	1 56 11 1	8 14 20 2	8 30 19 10	5 3 13 10	5 19 13 6																		
S.	13	3 26	2 12 10 11	2 28 10 9	8 46 19 5	9 3 18 11	5 36 13 2	5 54 12 10																		
S.	14	4 14	2 45 10 7	3 2 10 5	9 20 18 6	9 38 18 0	6 13 12 6	6 32 12 2																		
M.	15	5 1	3 20 10 3	3 38 10 0	9 58 17 5	10 20 17 0	6 54 11 9	7 17 11 5																		
Tu.	16	5 49	3 59 9 10	4 22 9 8	10 47 16 7	11 15 16 1	7 41 11 2	8 6 10 10																		
W.	17	6 38	4 46 9 6	5 14 9 5	11 50 15 9	— —	8 36 10 8	9 13 10 6																		
Th.	18	7 27	5 49 9 4	6 31 9 4	0 27 15 7	1 4 15 6	9 54 10 5	10 34 10 7																		
F.	19	8 16	7 15 9 6	7 57 9 8	1 42 15 8	2 21 16 2	11 13 10 10	11 46 11 3																		
S.	20	9 6	8 32 9 11	9 4 10 3	2 54 16 10	3 25 17 8	— —	0 16 11 9																		
S.	21	9 58	9 32 10 7	9 58 10 11	3 53 18 5	4 18 19 2	0 43 12 4	1 8 12 11																		
M.	22	10 51	10 21 11 3	10 43 11 6	4 39 19 10	5 0 20 6	1 32 13 5	1 55 13 11																		
Tu.	23	11 47	11 5 11 9	11 26 12 0	5 21 21 1	5 42 21 6	2 17 14 4	2 38 14 8																		
W.	24	morn.	11 47 12 2	— —	6 4 21 11	6 27 22 3	2 57 15 0	3 19 15 4																		
Th.	25	0 45	0 9 12 3	0 32 12 4	6 50 22 6	7 13 22 7	3 41 15 6	4 3 15 8																		
F.	26	1 44	0 54 12 3	1 17 12 2	7 36 22 6	7 58 22 4	4 26 15 7	4 48 15 5																		
S.	27	2 45	1 40 12 1	2 3 11 11	8 21 22 1	8 44 21 7	5 11 15 1	5 35 14 8																		
S.	28	3 45	2 27 11 8	2 51 11 5	9 9 20 11	9 34 20 3	6 1 14 3	6 28 13 9																		
M.	29	4 43	3 16 11 2	3 41 10 10	10 0 19 6	10 29 18 9	6 56 13 3	7 25 12 9																		
Tu.	30	5 39	4 8 10 7	4 36 10 4	11 2 18 1	11 40 17 6	7 55 12 3	8 28 11 10																		
W.	31	6 31	5 7 10 1	5 40 9 11	— —	0 18 17 0	9 4 11 6	9 44 11 3																		
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
Last Quarter 1 6 9 Morning.												1 17N.46 9 7S.47 17 15S.28 25 14N.36														
New - - - 8 4 58 Afternoon.												2 16 19 10 11 2 18 12 59 26 16 58														
First Quarter 16 9 24 Afternoon.												3 13 59 11 13 48 19 9 47 27 18 8														
Full - - - 24 0 12 Morning.												4 10 57 12 15 57 20 5 59 28 18 4														
Last Quarter 30 2 45 Afternoon.												5 7 25 13 17 25 21 1 44 29 16 52														
												6 3 36 14 18 8 22 2N.45 30 14 41														
In Apogee - 12 12 0 Midnight.												7 0S.19 15 18 4 23 7 12 11 46														
In Perigee - 25 5 0 Morning.												8 4 10 16 17 10 24 11 15														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.	
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
M.	1	5m53	4	25	9	0	4	55	8	9	3	36	22	3	4	10	21	6	10	47	17	0	11	18	16	4
Tu.	2	6 49	5	30	8	7	6	9	8	5	4	48	20	10	5	32	20	6	11	52	15	11	—	—	—	—
W.	3	7 42	6	52	8	3	7	35	8	4	6	21	20	6	7	5	20	9	0	33	15	10	1	21	15	11
Th.	4	8 34	8	16	8	6	8	51	8	8	7	45	21	5	8	18	22	0	2	7	16	5	2	44	17	0
F.	5	9 22	9	22	8	10	9	49	9	0	8	46	22	9	9	12	23	5	3	17	17	9	3	47	18	5
S.	6	10 9	10	12	9	2	10	35	9	3	9	32	24	0	9	52	24	7	4	12	19	0	4	36	19	6
☾	7	10 55	10	55	9	5	11	16	9	6	10	11	25	0	10	30	25	4	4	59	20	0	5	20	20	4
M.	8	11 40	11	36	9	7	11	55	9	8	10	48	25	7	11	7	25	10	5	40	20	7	5	59	20	10
Tu.	9	0a24	—	—	—	—	0	13	9	8	11	25	25	11	11	42	25	11	6	16	20	11	6	33	21	0
W.	10	1 9	0	30	9	9	0	48	9	8	11	59	25	10	—	—	—	—	6	49	20	11	7	5	20	8
Th.	11	1 54	1	4	9	8	1	19	9	7	0	15	25	8	0	30	25	5	7	20	20	5	7	36	20	2
F.	12	2 40	1	35	9	6	1	51	9	5	0	46	25	1	1	1	24	8	7	52	19	10	8	8	19	5
S.	13	3 26	2	7	9	4	2	23	9	3	1	17	24	1	1	33	23	7	8	25	18	11	8	42	18	5
☾	14	4 14	2	40	9	1	2	57	8	11	1	50	22	11	2	8	22	4	8	59	17	11	9	16	17	3
M.	15	5 1	3	15	8	9	3	36	8	8	2	26	21	8	2	47	21	1	9	35	16	9	9	55	16	3
Tu.	16	5 49	3	58	8	6	4	21	8	4	3	9	20	5	3	33	19	10	10	15	15	8	10	39	15	2
W.	17	6 38	4	49	8	2	5	23	8	1	4	4	19	5	4	41	19	11	11	9	14	9	11	44	14	8
Th.	18	7 27	6	1	8	0	6	41	7	11	5	24	19	0	6	10	19	4	—	—	—	—	0	23	14	9
F.	19	8 16	7	23	8	1	7	59	8	3	6	53	19	10	7	28	20	7	1	8	15	2	1	48	15	9
S.	20	9 6	8	33	8	6	9	1	8	9	8	1	21	6	8	27	22	5	2	25	16	6	2	56	17	5
☾	21	9 58	9	28	9	0	9	52	9	3	8	51	23	5	9	13	24	4	3	24	18	4	3	51	19	3
M.	22	10 51	10	15	9	6	10	37	9	8	9	34	25	3	9	54	26	0	4	16	20	1	4	40	20	10
Tu.	23	11 47	11	0	9	10	11	22	10	0	10	15	26	8	10	35	27	3	5	4	21	6	5	27	22	1
W.	24	morn.	11	47	10	2	—	—	—	—	10	58	27	9	11	22	28	0	5	50	22	6	6	13	22	10
Th.	25	0 45	0	11	10	3	0	34	10	4	11	45	28	2	—	—	—	—	6	36	23	0	6	58	22	11
F.	26	1 44	0	58	10	4	1	20	10	4	0	8	28	2	0	31	27	11	7	21	22	8	7	44	22	4
S.	27	2 45	1	42	10	3	2	5	10	1	0	53	27	7	1	16	26	10	8	7	21	10	8	31	21	2
☾	28	3 45	2	29	9	11	2	53	9	8	1	40	26	1	2	5	25	2	8	56	20	5	9	20	19	7
M.	29	4 43	3	18	9	6	3	45	9	3	2	30	24	4	2	56	23	5	9	45	18	10	10	10	18	0
Tu.	30	5 39	4	12	9	0	4	42	8	10	3	23	22	5	3	56	21	8	10	36	17	3	11	3	16	6
W.	31	6 31	5	14	8	7	5	51	8	5	4	32	20	11	5	14	20	7	11	36	16	1	—	—	—	—
Half Mean Spring Range.			4ft. 10in.								13ft. 0in.								10ft. 6in.							

Phases of the Moon.					Moon's Declination at Noon.											
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter-	1	6	9	Morning.	1	17	N.46	9	7	8.47	17	15	8.28	25	14	N.36
New - - - - -	8	4	58	Afternoon.	2	16	19	10	11	2	18	12	59	26	16	58
First Quarter	16	9	24	Afternoon.	3	13	59	11	13	48	19	9	47	27	18	8
Full - - - - -	24	0	12	Morning.	4	10	57	12	15	57	20	5	59	28	18	4
Last Quarter-	30	2	45	Afternoon.	5	7	25	13	17	25	21	1	44	29	16	52
					6	3	36	14	18	8	22	2	N.45	30	14	41
In Apogee - -	12	12	0	Midnight.	7	0	8.19	15	18	4	23	7	12	31	11	46
In Perigee - -	25	5	0	Morning.	8	4	10	16	17	10	24	11	15			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
M.	1	11	16	31	1	11	50	30	0	2	40	13	10	3	16	13	4	3	39	9	7	4	15	9	4	☾
Tu.	2	—	—	—	—	0	28	29	4	3	57	13	0	4	41	12	10	4	54	9	1	5	32	8	11	23'4
W.	3	1	12	29	2	1	56	29	3	5	24	12	11	6	6	13	1	6	12	9	0	6	53	9	2	24'4
Th.	4	2	39	30	0	3	18	30	10	6	43	13	4	7	14	13	8	7	30	9	4	8	4	9	7	25'4
F.	5	3	54	31	10	4	26	32	10	7	42	14	1	8	7	14	6	8	34	9	9	9	2	10	0	26'4
S.	6	4	53	33	11	5	18	34	9	8	28	14	10	8	47	15	2	9	26	10	2	9	47	10	5	27'4
S.	7	5	40	35	7	6	1	36	2	9	5	15	6	9	24	15	8	10	5	10	7	10	22	10	9	28'4
M.	8	6	22	36	6	6	41	36	10	9	42	15	10	9	59	15	11	10	39	10	10	10	56	10	11	●
Tu.	9	6	59	37	1	7	17	37	3	10	15	16	0	10	30	16	0	11	13	11	0	11	30	10	11	0'8
W.	10	7	34	37	1	7	49	36	10	10	46	15	11	11	0	15	9	11	47	10	10	—	—	—	—	1'8
Th.	11	8	3	36	6	8	18	36	1	11	15	15	7	11	32	15	5	0	3	10	9	0	19	10	8	2'8
F.	12	8	33	35	7	8	48	35	0	11	49	15	2	—	—	—	—	0	36	10	6	0	52	10	4	3'8
S.	13	9	3	34	4	9	18	33	6	0	7	14	10	0	26	14	6	1	9	10	2	1	27	10	0	4'8
S.	14	9	33	32	8	9	47	31	7	0	45	14	2	1	4	13	9	1	45	9	9	2	4	9	7	5'8
M.	15	10	4	30	9	10	22	29	9	1	25	13	4	1	48	13	0	2	25	9	4	2	47	9	2	6'8
Tu.	16	10	42	28	10	11	9	28	1	2	13	12	8	2	39	12	4	3	11	9	0	3	37	8	9	7'8
W.	17	11	43	27	6	—	—	—	—	3	12	12	1	3	50	11	11	4	10	8	7	4	47	8	6	8'8
Th.	18	0	20	27	2	1	1	27	6	4	33	12	0	5	14	12	2	5	24	8	6	6	3	8	7	9'8
F.	19	1	44	28	0	2	22	28	11	5	54	12	6	6	27	12	11	6	41	8	10	7	14	9	1	10'8
S.	20	2	58	30	2	3	30	31	4	6	57	13	5	7	23	13	11	7	46	9	5	8	14	9	8	11'8
S.	21	4	2	32	10	4	30	34	3	7	47	14	6	8	8	15	0	8	40	10	0	9	5	10	4	12'8
M.	22	4	57	35	8	5	22	37	0	8	29	15	7	8	49	16	1	9	28	10	7	9	49	10	11	13'8
Tu.	23	5	46	38	0	6	9	38	11	9	9	16	6	9	30	16	10	10	7	11	2	10	26	11	5	14'8
W.	24	6	33	39	7	6	56	40	1	9	51	17	1	10	12	17	3	10	48	11	7	11	11	11	8	15'8
Th.	25	7	19	40	6	7	42	40	4	10	32	17	4	10	53	17	3	11	33	11	8	11	56	11	7	16'8
F.	26	8	4	40	1	8	25	39	8	11	16	17	1	11	40	16	11	—	—	—	—	0	20	11	6	17'8
S.	27	8	47	38	11	9	9	38	0	—	—	—	—	0	5	16	6	0	44	11	4	1	8	11	1	18'8
S.	28	9	31	36	9	9	53	35	5	0	32	16	0	1	0	15	6	1	33	10	10	1	59	10	6	19'8
M.	29	10	14	34	0	10	37	32	8	1	28	14	11	1	57	14	5	2	27	10	3	2	56	9	11	20'8
Tu.	30	11	3	31	4	11	34	30	3	2	27	13	11	3	2	13	5	3	25	9	8	4	1	9	4	☾
W.	31	—	—	—	—	0	11	29	5	3	40	13	1	4	23	12	11	4	38	9	2	5	16	9	0	22'8
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	20		9	12	41		17	14	34		25	15	50	
2	10	39		10	12	57		18	14	45		26	15	56	
3	10	57		11	13	12		19	14	57		27	16	2	
4	11	15		12	13	27		20	15	7		28	16	6	
5	11	33		13	13	41		21	15	17		29	16	11	
6	11	51		14	13	55		22	15	26		30	16	14	
7	12	8		15	14	9		23	15	35		31	16	16	
8	12	25		16	14	22		24	15	42					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.			
M.	1	5m53	3 22	8 7	3 57	8 5	0 38	6 1	1 22	5 11	10 25	8 10	11 6	8 7															
Tu.	2	6 49	4 35	8 3	5 14	8 2	2 9	5 10	2 51	5 10	11 47	8 6	—	—															
W.	3	7 42	5 54	8 1	6 37	8 1	3 31	6 0	4 9	6 2	0 28	8 6	1 11	8 7															
Th.	4	8 34	7 17	8 2	7 49	8 4	4 40	6 5	5 5	6 7	1 49	8 10	2 21	9 2															
F.	5	9 22	8 16	8 7	8 41	8 9	5 29	6 9	5 52	6 11	2 47	9 6	3 11	9 10															
S.	6	10 9	9 2	9 0	9 23	9 2	6 13	7 1	6 34	7 3	3 30	10 2	3 49	10 5															
S.	7	10 55	9 41	9 3	10 0	9 4	6 53	7 5	7 13	7 6	4 7	10 8	4 26	10 11															
M.	8	11 40	10 18	9 5	10 35	9 5	7 32	7 7	7 49	7 8	4 45	11 1	5 3	11 2															
Tu.	9	02 24	10 52	9 6	11 8	9 5	8 5	7 9	8 20	7 9	5 21	11 3	5 38	11 3															
W.	10	1 9	11 24	9 5	11 38	9 4	8 36	7 8	8 50	7 6	5 54	11 2	6 9	11 0															
Th.	11	1 54	11 54	9 3	—	—	9 4	7 5	9 19	7 3	6 24	10 10	6 40	10 7															
F.	12	2 40	0 11	9 3	0 28	9 2	9 34	7 1	9 50	6 10	6 57	10 4	7 13	10 0															
S.	13	3 26	0 46	9 0	1 4	8 11	10 6	6 8	10 23	6 5	7 29	9 9	7 46	9 5															
S.	14	4 14	1 24	8 10	1 45	8 8	10 43	6 3	11 8	6 0	8 5	9 1	8 26	8 10															
M.	15	5 1	2 7	8 6	2 30	8 4	11 36	5 9	—	—	8 51	8 7	9 18	8 3															
Tu.	16	5 49	2 55	8 2	3 20	8 1	0 8	5 6	0 41	5 4	9 46	8 1	10 21	7 11															
W.	17	6 38	3 51	8 0	4 28	7 11	1 19	5 3	2 2	5 3	10 59	7 10	11 39	7 11															
Th.	18	7 27	5 6	7 10	5 45	7 10	2 43	5 4	3 22	5 7	—	—	0 19	8 0															
F.	19	8 16	6 25	7 11	7 0	8 0	3 59	5 10	4 26	6 2	0 59	8 3	1 33	8 6															
S.	20	9 6	7 31	8 3	7 57	8 6	4 51	6 5	5 11	6 8	2 4	8 11	2 29	9 4															
S.	21	9 58	8 21	8 9	8 42	9 0	5 32	6 11	5 52	7 3	2 52	9 9	3 12	10 3															
M.	22	10 51	9 4	9 3	9 25	9 6	6 14	7 6	6 36	7 9	3 31	10 8	3 51	11 2															
Tu.	23	11 47	9 45	9 8	10 5	9 9	6 58	7 11	7 19	8 2	4 11	11 6	4 32	11 9															
W.	24	morn.	10 27	9 11	10 49	9 11	7 41	8 4	8 3	8 5	4 55	12 0	5 18	12 2															
Th.	25	0 45	11 10	9 11	11 32	9 11	8 23	8 5	8 43	8 4	5 40	12 3	6 2	12 1															
F.	26	1 44	11 55	9 10	—	—	9 5	8 2	9 26	8 0	6 25	11 11	6 48	11 8															
S.	27	2 45	0 19	9 9	0 44	9 8	9 48	7 9	10 12	7 6	7 12	11 3	7 36	10 10															
S.	28	3 45	1 10	9 6	1 39	9 4	10 38	7 2	11 8	6 10	8 1	10 5	8 28	10 0															
M.	29	4 43	2 8	9 1	2 38	8 10	11 44	6 6	—	—	8 59	9 7	9 33	9 2															
Tu.	30	5 39	3 9	8 8	3 43	8 6	0 23	6 1	1 5	5 11	10 10	8 11	10 49	8 8															
W.	31	6 31	4 19	8 4	4 56	8 3	1 51	5 10	2 34	5 10	11 30	8 7	—	—															
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.																		
Phases of the Moon.															Moon's Declination at Noon.														
			D.		H. M.					M.D.		°		M.D.		°		M.D.		°		M.D.		°		M.D.		°	
Last Quarter -			1		6 9			Morning.				1		17 N.46		9		78.47		17		15 8.28		25		14 N.36			
New - - - - -			8		4 58			Afternoon.				2		16 19		10		11 2		18		12 59		26		16 58			
First Quarter -			16		9 24			Afternoon.				3		13 59		11		13 48		19		9 47		27		18 8			
Full - - - - -			24		0 12			Morning.				4		10 57		12		15 57		20		5 59		28		18 4			
Last Quarter -			30		2 45			Afternoon.				5		7 25		13		17 25		21		1 44		29		16 52			
In Apogee - -			12		12 0			Midnight.				6		3 36		14		18 8		22		2 N.45		30		14 41			
In Perigee - -			25		5 0			Morning.				7		0 8.12		15		18 4		23		7 12		31		11 46			
												8		4 10		16		17 10		24		11 15							

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

OCTOBER, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.										
M.	1	9	36	11	8	10	14	11	3	9	41	9	9	10	14	9	6	9	59	10	9	10	36	10	4	(
Tu.	2	10	56	11	1	11	40	11	2	10	54	9	4	11	38	9	3	11	14	10	1	11	53	10	0	23'4
W.	3	—	—	—	—	0	23	11	3	—	—	—	—	0	21	9	4	—	—	—	—	0	34	10	1	24'4
Th.	4	1	1	11	7	1	32	12	0	1	3	9	7	1	41	9	10	1	13	10	3	1	49	10	7	25'4
F.	5	1	59	12	6	2	26	12	11	2	13	10	1	2	41	10	5	2	24	10	11	2	56	11	2	26'4
S.	6	2	48	13	3	3	9	13	8	3	6	10	8	3	29	11	0	3	22	11	6	3	47	11	9	27'4
S.	7	3	27	14	0	3	46	14	3	3	49	11	3	4	9	11	5	4	9	12	0	4	31	12	2	28'4
M.	8	4	5	14	6	4	22	14	8	4	28	11	7	4	47	11	8	4	51	12	3	5	9	12	3	●
Tu.	9	4	39	14	9	4	56	14	10	5	5	11	9	5	23	11	9	5	26	12	4	5	43	12	5	0'8
W.	10	5	13	14	9	5	30	14	7	5	41	11	8	5	57	11	7	6	0	12	4	6	17	12	3	1'8
Th.	11	5	46	14	5	6	2	14	2	6	12	11	6	6	28	11	4	6	33	12	3	6	49	12	1	2'8
F.	12	6	17	13	11	6	34	13	7	6	44	11	2	7	0	10	11	7	4	11	11	7	20	11	10	3'8
S.	13	6	52	13	2	7	10	12	10	7	16	10	8	7	33	10	5	7	36	11	8	7	52	11	5	4'8
S.	14	7	29	12	5	7	50	11	11	7	50	10	2	8	7	9	10	8	8	11	2	8	24	10	11	5'8
M.	15	8	12	11	5	8	35	11	0	8	26	9	7	8	47	9	4	8	42	10	8	9	1	10	4	6'8
Tu.	16	8	59	10	7	9	30	10	4	9	8	9	1	9	33	8	10	9	23	10	1	9	53	9	10	7'8
W.	17	10	7	10	2	10	48	10	2	10	7	8	9	10	46	8	8	10	29	9	7	11	6	9	6	8'8
Th.	18	11	30	10	4	—	—	—	—	11	27	8	9	—	—	—	—	11	44	9	5	—	—	—	—	9'8
F.	19	0	11	10	8	0	45	11	1	0	9	8	11	0	46	9	3	0	22	9	8	0	56	9	11	10'8
S.	20	1	15	11	8	1	40	12	3	1	22	9	7	1	52	10	0	1	29	10	4	2	1	10	9	11'8
S.	21	2	4	12	11	2	27	13	6	2	20	10	5	2	45	10	10	2	32	11	2	3	0	11	7	12'8
M.	22	2	50	14	1	3	11	14	8	3	8	11	3	3	31	11	8	3	26	12	0	3	51	12	5	13'8
Tu.	23	3	31	15	1	3	52	15	6	3	54	12	0	4	16	12	3	4	16	12	9	4	39	13	0	14'8
W.	24	4	14	15	11	4	36	16	2	4	39	12	6	5	3	12	8	5	2	13	2	5	24	13	3	15'8
Th.	25	4	59	16	4	5	23	16	3	5	26	12	8	5	49	12	9	5	47	13	4	6	10	13	5	16'8
F.	26	5	46	16	1	6	9	15	10	6	12	12	8	6	35	12	6	6	33	13	4	6	56	13	3	17'8
S.	27	6	33	15	5	6	58	14	11	6	58	12	2	7	22	11	10	7	19	13	0	7	42	12	9	18'8
S.	28	7	25	14	4	7	52	13	8	7	47	11	5	8	11	11	1	8	6	12	5	8	29	12	0	19'8
M.	29	8	21	13	0	8	50	12	3	8	35	10	7	9	1	10	2	8	52	11	8	9	16	11	3	20'8
Tu.	30	9	22	11	9	9	58	11	4	9	28	9	10	9	59	9	7	9	45	10	10	10	21	10	5	21'8
W.	31	10	38	11	2	11	19	11	2	10	37	9	4	11	16	9	3	10	58	10	2	11	34	10	0	22'8
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	20		9	12	41		17	14	34		25	15	50	
2	10	39		10	12	57		18	14	45		26	15	56	
3	10	57		11	13	12		19	14	57		27	16	2	
4	11	15		12	13	27		20	15	7		28	16	6	
5	11	33		13	13	41		21	15	17		29	16	11	
6	11	51		14	13	55		22	15	26		30	16	14	
7	12	8		15	14	9		23	15	35		31	16	16	
8	12	25		16	14	22		24	15	42					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

NOVEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
Th.	1	7m21	10	56	14	3	11	36	14	5	—	—	0	24	12	11	6	4	10	2	6	45	10	3		
F.	2	8 8	—	—	—	—	0	10	14	10	1	3	12	5	1	41	13	3	7	23	10	5	7	59	10	8
S.	3	8 53	0	42	15	3	1	9	15	10	2	17	13	0	2	46	13	11	8	33	11	0	9	1	11	3
S.	4	9 38	1	32	16	4	1	54	16	10	3	12	13	9	3	37	14	5	9	26	11	6	9	49	11	8
M.	5	10 22	2	14	17	4	2	32	17	9	4	1	14	4	4	23	14	10	10	9	11	11	10	28	12	1
Tu.	6	11 6	2	50	18	1	3	7	18	4	4	43	14	9	5	2	15	0	10	46	12	2	11	3	12	3
W.	7	11 51	3	24	18	5	3	41	18	5	5	19	15	0	5	36	15	0	11	20	12	3	11	37	12	4
Th.	8	0a36	3	58	18	5	4	14	18	4	5	52	15	0	6	8	15	0	11	54	12	3	—	—	—	—
F.	9	1 22	4	29	18	2	4	45	17	11	6	25	14	11	6	39	14	8	0	12	12	3	0	29	12	2
S.	10	2 9	5	1	17	8	5	16	17	5	6	53	14	8	7	8	14	3	0	45	12	0	1	1	11	11
S.	11	2 57	5	32	17	2	5	49	16	9	7	23	14	3	7	38	13	8	1	17	11	10	1	33	11	8
M.	12	3 44	6	8	16	4	6	27	15	10	7	54	13	10	8	10	13	1	1	50	11	6	2	9	11	4
Tu.	13	4 32	6	48	15	5	7	10	14	11	8	27	13	3	8	45	12	6	2	28	11	2	2	48	11	0
W.	14	5 20	7	33	14	5	7	58	14	0	9	8	12	9	9	32	11	11	3	9	10	9	3	31	10	7
Th.	15	6 7	8	28	13	8	9	2	13	6	9	58	12	4	10	29	11	8	3	55	10	4	4	24	10	2
F.	16	6 55	9	38	13	8	10	17	13	11	11	2	12	3	11	42	11	9	4	56	10	0	5	31	10	0
S.	17	7 44	10	55	14	3	11	32	14	9	—	—	—	—	0	22	12	7	6	8	10	0	6	44	10	3
S.	18	8 35	—	—	—	—	0	4	15	5	1	2	12	5	1	40	13	5	7	19	10	7	7	53	11	0
M.	19	9 28	0	34	16	2	1	2	16	11	2	15	13	5	2	46	14	4	8	25	11	5	8	54	11	9
Tu.	20	10 25	1	27	17	8	1	51	18	6	3	14	14	7	3	42	15	2	9	21	12	2	9	46	12	6
W.	21	11 24	2	13	19	2	2	37	19	11	4	8	15	4	4	33	15	9	10	10	12	10	10	34	13	1
Th.	22	morn.	3	1	20	5	3	25	20	7	4	58	16	0	5	23	16	3	10	58	13	3	11	21	13	5
F.	23	0 25	3	49	20	9	4	14	20	9	5	48	16	5	6	13	16	5	11	46	13	6	—	—	—	—
S.	24	1 28	4	38	20	8	5	3	20	5	6	38	16	6	6	59	16	2	0	12	13	6	0	38	13	5
S.	25	2 29	5	27	19	11	5	51	19	5	7	21	16	3	7	46	15	8	1	3	13	3	1	29	13	1
M.	26	3 29	6	16	18	9	6	41	18	0	8	10	15	9	8	33	14	11	1	51	12	10	2	17	12	6
Tu.	27	4 24	7	8	17	3	7	35	16	5	8	56	15	0	9	21	14	0	2	42	12	3	3	8	11	10
W.	28	5 16	8	2	15	8	8	30	15	1	9	47	14	1	10	11	13	0	3	33	11	6	3	59	11	2
Th.	29	6 5	9	0	14	8	9	35	14	4	10	37	13	3	11	8	12	4	4	26	10	10	4	56	10	7
F.	30	6 52	10	11	14	2	10	48	14	3	11	42	12	9	—	—	—	—	5	28	10	4	6	2	10	3
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
New - - - - - 7 10 25 Morning.												1 8 N.20 9 17 S.11 17 3 S.38 25 17 N.36														
First Quarter- 15 2 7 Afternoon.												2 4 35 10 18 8 18 0 N.41 26 15 41														
Full - - - - - 22 10 15 Morning.												3 0 42 11 18 18 19 5 6 27 12 53														
Last Quarter - 29 3 5 Morning.												4 3 S.10 12 17 39 20 9 22 28 9 29														
In Apogee - - 9 0 0 Noon.												5 6 51 13 16 13 21 13 9 29 5 44														
In Perigee - - 22 4 0 Afternoon.												6 10 13 14 14 1 22 16 5 30 1 48														
												7 13 8 15 11 8 23 17 53 31														
												8 15 29 16 7 38 24 18 23														

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

NOVEMBER, 1866.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE NOON
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	
	1	5 34	14 9	6 11	14 10	7 14	13 4	7 56	13 4	8 41	16 1	9 21	16 1	23'
	2	6 49	15 1	7 25	15 5	8 36	13 6	9 14	13 9	10 3	16 2	10 40	16 3	24'
	3	7 58	15 10	8 24	16 3	9 47	14 0	10 18	14 3	11 17	16 5	11 46	16 9	25'
	4	8 49	16 8	9 12	17 0	10 43	14 7	11 6	14 10	—	—	0 12	17 0	26'
	5	9 33	17 3	9 54	17 7	11 27	15 1	11 46	15 3	0 35	17 4	0 57	17 8	27'
	6	10 13	17 9	10 31	17 11	—	—	0 5	15 6	1 16	17 11	1 35	18 2	28'
	7	10 50	18 0	11 9	18 1	0 23	15 7	0 40	15 9	1 52	18 4	2 9	18 6	29'
	8	11 27	18 1	11 45	18 0	0 57	15 9	1 13	15 10	2 26	18 7	2 42	18 8	30'
	9	—	—	0 2	17 11	1 30	15 9	1 46	15 8	2 58	18 9	3 15	18 8	31'
	10	0 20	17 10	0 38	17 8	2 1	15 7	2 16	15 5	3 30	18 7	3 46	18 6	32'
	11	0 54	17 5	1 12	17 3	2 31	15 3	2 46	15 1	4 3	18 4	4 17	18 2	33'
	12	1 30	17 0	1 49	16 9	3 2	14 11	3 19	14 8	4 33	18 0	4 52	17 10	34'
	13	2 9	16 5	2 30	16 1	3 38	14 5	3 58	14 2	5 9	17 6	5 27	17 3	35'
	14	2 51	15 8	3 12	15 4	4 18	13 10	4 40	13 7	5 47	17 0	6 8	16 9	36'
	15	3 36	15 0	4 3	14 8	5 5	13 5	5 32	13 2	6 32	16 5	6 59	16 2	37'
	16	4 33	14 5	5 4	14 5	6 5	13 0	6 41	12 11	7 31	16 0	8 7	15 10	38'
	17	5 37	14 6	6 10	14 10	7 19	13 0	7 59	13 2	8 47	15 11	9 24	16 0	39'
	18	6 45	15 4	7 19	15 11	8 35	13 6	9 10	13 11	10 0	16 2	10 35	16 6	40'
	19	7 50	16 6	8 17	17 2	9 41	14 4	10 10	14 9	11 8	16 10	11 38	17 3	41'
	20	8 44	17 9	9 9	18 3	10 36	15 2	11 1	15 7	—	—	0 5	17 8	42'
	21	9 34	18 9	10 0	19 3	11 24	16 0	11 46	16 4	0 28	18 2	0 53	18 8	43'
	22	10 26	19 8	10 52	19 10	—	—	0 10	16 8	1 19	19 1	1 42	19 6	44'
	23	11 19	20 0	11 46	20 1	0 34	16 11	0 58	17 0	2 6	19 10	2 28	20 0	45'
	24	—	—	0 12	20 0	1 22	17 1	1 46	17 1	2 52	20 2	3 17	20 3	46'
	25	0 39	19 10	1 6	19 6	2 10	16 11	2 33	16 9	3 40	20 2	4 2	20 0	47'
	26	1 32	19 1	1 57	18 8	2 57	16 6	3 21	16 2	4 28	19 9	4 53	19 5	48'
	27	2 23	18 2	2 49	17 6	3 46	15 9	4 11	15 4	5 17	19 0	5 42	18 7	49'
W.	28	3 14	17 0	3 40	16 5	4 38	14 11	5 5	14 6	6 8	18 2	6 36	17 8	50'
Th.	29	4 6	15 10	4 33	15 4	5 34	14 2	6 5	13 10	7 3	17 3	7 34	16 11	51'
F.	30	5 3	15 0	5 33	14 10	6 39	13 6	7 16	13 5	8 9	16 7	8 45	16 4	52'
Half Mean Spring Range.		9 ^{ft.} 4 ^{in.}				8 ^{ft.} 0 ^{in.}				9 ^{ft.} 7 ^{in.}				

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	18		9	16	2		17	14	52		25	12	51	
2	16	19		10	15	56		18	14	40		26	12	32	
3	16	19		11	15	50		19	14	27		27	12	12	
4	16	18		12	15	42		20	14	13		28	11	52	
5	16	17		13	15	34		21	13	58		29	11	31	
6	16	14		14	15	25		22	13	42		30	11	10	
7	16	11		15	15	15		23	13	26					
8	16	7		16	15	4		24	13	9					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

NOVEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.					
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Th.	1	7m21	6	20	9	10	7	4	9	11	0	56	16	9	1	32	16	8	10	23	11	3	11	2	11	4			
F.	2	8 8	7	44	10	0	8	21	10	1	2	8	16	10	2	43	17	2	11	36	11	6	—	—					
S.	3	8 53	8	54	10	3	9	25	10	6	3	15	17	9	3	46	18	2	0	7	11	10	0	37	12	2			
♄.	4	9 38	9	52	10	8	10	17	10	10	4	12	18	7	4	35	19	0	1	3	12	6	1	27	12	10			
M.	5	10 22	10	38	11	0	10	58	11	2	4	55	19	4	5	15	19	8	1	50	13	0	2	10	13	3			
Tu.	6	11 6	11	18	11	3	11	36	11	4	5	34	19	11	5	52	20	0	2	30	13	6	2	48	13	8			
W.	7	11 51	11	53	11	5	—	—	—	—	6	10	20	2	6	28	20	3	3	4	13	9	3	20	13	10			
Th.	8	0a36	0	10	11	5	0	26	11	4	6	45	20	3	7	2	20	3	3	36	13	11	3	53	14	0			
F.	9	1 22	0	42	11	4	0	59	11	3	7	18	20	2	7	34	20	1	4	9	13	11	4	23	13	10			
S.	10	2 9	1	15	11	2	1	31	11	0	7	49	19	11	8	5	19	8	4	39	13	8	4	55	13	6			
♄.	11	2 57	1	47	10	11	2	3	10	9	8	21	19	5	8	37	19	1	5	11	13	3	5	28	12	11			
M.	12	3 44	2	20	10	8	2	38	10	6	8	55	18	9	9	14	18	4	5	46	12	8	6	6	12	5			
Tu.	13	4 32	2	56	10	1	3	15	10	2	9	33	17	11	9	54	17	7	6	28	12	2	6	50	11	11			
W.	14	5 20	3	34	10	1	3	55	9	11	10	17	17	2	10	43	16	10	7	13	11	7	7	37	11	4			
Th.	15	6 7	4	18	9	10	4	44	9	8	11	13	16	6	11	50	16	3	8	4	11	2	8	37	11	0			
F.	16	6 55	5	14	9	7	5	48	9	7	—	—	—	—	0	26	16	1	9	12	10	10	9	50	10	11			
S.	17	7 44	6	26	9	8	7	7	9	9	1	1	16	2	1	35	16	5	10	27	11	1	11	0	11	4			
♄.	18	8 35	7	43	10	0	8	17	10	3	2	7	16	10	2	39	17	6	11	32	11	9	—	—					
M.	19	9 28	8	48	10	6	9	17	10	9	3	9	18	3	3	38	18	11	0	1	12	2	0	29	12	8			
Tu.	20	10 25	9	45	11	1	10	12	11	4	4	5	19	7	4	30	20	2	0	56	13	2	1	22	13	8			
W.	21	11 24	10	36	11	7	10	59	11	10	4	52	20	9	5	14	21	3	1	47	14	1	2	11	14	5			
Th.	22	morn.	11	23	12	1	11	47	12	2	5	39	21	8	6	4	22	0	2	35	14	9	2	58	15	1			
F.	23	0 25	—	—	—	—	0	11	12	3	6	29	22	2	6	54	22	4	3	21	15	3	3	45	15	5			
S.	24	1 28	0	35	12	3	1	0	12	2	7	19	22	4	7	43	22	3	4	9	15	6	4	33	15	5			
♄.	25	2 29	1	24	12	1	1	49	11	11	8	7	22	0	8	32	21	7	4	57	15	2	5	22	14	9			
M.	26	3 29	2	14	11	9	2	39	11	6	8	57	21	0	9	22	20	5	5	48	14	4	6	14	13	11			
Tu.	27	4 24	3	4	11	3	3	29	11	0	9	47	19	10	10	14	19	2	6	41	13	6	7	10	13	0			
W.	28	5 16	3	54	10	9	4	20	10	6	10	42	18	7	11	15	18	0	7	38	12	7	8	7	12	2			
Th.	29	6 5	4	48	10	3	5	16	10	1	11	49	17	6	—	—	—	—	8	37	11	10	9	10	11	7			
F.	30	6 52	5	46	10	0	6	22	9	11	0	24	17	1	0	58	16	10	9	47	11	4	10	22	11	3			
Half Mean Spring Range			5ft. 9in.								10ft. 5in.								7ft. 2in.										
Phases of the Moon.												Moon's Declination at Noon.																	
D. H. M.												M.D. ° ' "																	
New - - - - - 7 10 25 Morning.												1 8N.20 9 17 8. 11 17 38.38 25 17N.36																	
First Quarter 15 2 7 Afternoon.												2 4 35 10 18 8 18 0N.41 26 15 41																	
Full - - - - - 22 10 15 Morning.												3 0 42 11 18 18 19 5 6 27 12 53																	
Last Quarter - 29 3 5 Morning.												4 3 8.10 12 17 39 20 9 22 28 9 29																	
In Apogee - - 9 0 0 Noon.												5 6 51 13 16 13 21 13 9 29 5 44																	
In Perigee - - 22 4 0 Afternoon.												6 10 13 14 14 1 22 16 5 30 1 48																	
												7 13 8 15 11 8 23 17 53																	
												8 15 29 16 7 38 24 18 23																	

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

NOVEMBER, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				D.
		H. M.	F. I.		H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.				
Th.	1	10 36	10 3		11 14	10 4			9 30	12 10			10 8	13 0			3 27	9 9			4 7	9 9			23.8	
F.	2	11 50	10 7		—	—			10 43	13 2			11 14	13 5			4 44	9 10			5 15	10 1			24.8	
S.	3	0 20	10 10		0 49	11 0			11 43	13 8			—	—			5 45	10 5			6 9	10 10			25.8	
S.	4	1 13	11 4		1 34	11 7			0 7	14 1			0 29	14 5			6 29	11 3			6 47	11 7			26.8	
M.	5	1 55	11 10		2 14	12 2			0 49	14 9			1 9	15 1			7 4	12 0			7 20	12 4			27.8	
Tu.	6	2 32	12 5		2 48	12 7			1 28	15 5			1 45	15 7			7 35	12 7			7 51	12 9			28.8	
W.	7	3 4	12 8		3 20	12 9			2 2	15 9			2 18	15 10			8 7	12 10			8 22	12 10			●	
Th.	8	3 37	12 10		3 53	12 10			2 34	15 11			2 50	15 10			8 38	12 9			8 54	12 8			1.1	
F.	9	4 9	12 9		4 25	12 7			3 5	15 9			3 21	15 7			9 10	12 6			9 27	12 4			2.1	
S.	10	4 42	12 4		4 59	12 2			3 37	15 4			3 53	15 2			9 43	12 2			10 0	11 11			3.1	
S.	11	5 15	12 0		5 32	11 9			4 9	14 11			4 26	14 8			10 17	11 7			10 35	11 4			4.1	
M.	12	5 50	11 7		6 9	11 4			4 44	14 6			5 4	14 2			10 56	11 0			11 18	10 8			5.1	
Tu.	13	6 30	11 1		6 52	10 10			5 26	13 11			5 48	13 7			11 40	10 5			—	—			6.1	
W.	14	7 15	10 7		7 42	10 3			6 11	13 3			6 36	13 0			0 3	10 1			0 28	9 10			7.1	
Th.	15	8 11	9 11		8 46	9 9			7 5	12 8			7 40	12 6			0 56	9 7			1 31	9 5			8.1	
F.	16	9 24	9 9		10 2	9 10			8 16	12 5			8 54	12 6			2 8	9 4			2 48	9 5			9.1	
S.	17	10 39	10 0		11 13	10 4			9 34	12 8			10 7	13 0			3 30	9 6			4 6	9 9			10.1	
S.	18	11 46	10 9		—	—			10 39	13 4			11 8	13 10			4 40	10 1			5 10	10 5			11.1	
M.	19	0 15	11 2		0 41	11 7			11 36	14 3			12 0	14 9			5 37	10 11			6 2	11 6			12.1	
Tu.	20	1 6	12 0		1 29	12 5			—	—			0 23	15 4			6 23	12 2			6 43	12 9			13.1	
W.	21	1 51	12 10		2 13	13 3			0 46	15 11			1 9	16 5			7 1	13 3			7 23	13 10			14.1	
Th.	22	2 36	13 8		2 59	14 0			1 33	16 10			1 57	17 2			7 45	14 3			8 8	14 5			15.1	
F.	23	3 22	14 2		3 46	14 3			2 20	17 5			2 43	17 6			8 31	14 5			8 55	14 5			16.1	
S.	24	4 10	14 3		4 35	14 1			3 6	17 5			3 30	17 3			9 19	14 3			9 45	14 0			17.1	
S.	25	5 0	13 10		5 26	13 6			3 55	17 0			4 21	16 8			10 11	13 7			10 37	13 2			18.1	
M.	26	5 52	13 2		6 17	12 10			4 46	16 3			5 12	15 10			11 4	12 8			11 31	12 2			19.1	
Tu.	27	6 43	12 5		7 11	12 0			5 39	15 5			6 7	14 10			11 59	11 8			—	—			20.1	
W.	28	7 41	11 6		8 12	11 0			6 36	14 4			7 7	13 10			0 28	11 2			0 58	10 9			21.1	
Th.	29	8 45	10 8		9 21	10 5			7 40	13 6			8 14	13 2			1 30	10 5			2 5	10 1			22.1	
F.	30	9 59	10 3		10 34	10 3			8 52	13 0			9 29	12 11			2 44	9 11			3 25	9 10			23.1	
Half Mean Spring Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	18		9	16	2		17	14	52		25	12	51	
2	16	19		10	15	56		18	14	40		26	12	32	
3	16	19		11	15	50		19	14	27		27	12	12	
4	16	18		12	15	42		20	14	13		28	11	52	
5	16	17		13	15	34		21	13	58		29	11	31	
6	16	14		14	15	25		22	13	42		30	11	10	
7	16	11		15	15	15		23	13	26					
8	16	7		16	15	4		24	13	9					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 1 m. THURSO add 14 m.

NOVEMBER, 1866.

WEEK DAY.		MONTH DAY.		MOON'S TRANSIT.		GREENOCK.								LIVERPOOL.								PEMBROKE.							
						MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
						Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
						H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Th.	1	7	m21	6	30	8	4	7	10	8	4	5	57	20	7	6	40	20	9	0	11	15	11	0	54	15	11		
F.	2	8	8	7	48	8	5	8	22	8	7	7	17	21	1	7	51	21	7	1	36	16	2	2	14	16	7		
S.	3	8	53	8	55	8	9	9	22	8	10	8	21	22	2	8	46	22	9	2	49	17	2	3	18	17	9		
S.	4	9	38	9	47	9	0	10	9	9	1	9	8	23	3	9	29	23	9	3	45	18	3	4	9	18	9		
M.	5	10	22	10	30	9	2	10	51	9	3	9	48	24	2	10	6	24	6	4	32	19	2	4	54	19	7		
Tu.	6	11	6	11	10	9	4	11	28	9	4	10	24	24	9	10	42	24	11	5	14	19	10	5	33	20	0		
W.	7	11	51	11	47	9	5	—	—	—	—	10	59	25	1	11	16	25	2	5	51	20	2	6	8	20	3		
Th.	8	0	a36	0	5	9	6	0	22	9	6	11	33	25	2	11	50	25	1	6	24	20	3	6	40	20	2		
F.	9	1	22	0	39	9	6	0	55	9	5	—	—	—	—	0	6	24	11	6	56	20	1	7	12	19	10		
S.	10	2	9	1	11	9	5	1	27	9	4	0	22	24	9	0	38	24	6	7	28	19	7	7	44	19	4		
S.	11	2	57	1	42	9	4	1	59	9	3	0	53	24	2	1	9	23	8	8	0	19	0	8	18	18	8		
M.	12	3	44	2	16	9	2	2	34	9	0	1	26	23	3	1	44	22	9	8	36	18	3	8	54	17	10		
Tu.	13	4	32	2	52	8	11	3	11	8	10	2	3	22	3	2	22	21	10	9	13	17	5	9	23	17	0		
W.	14	5	20	3	32	8	8	3	55	8	7	2	43	21	4	3	6	20	10	9	53	16	7	10	15	16	2		
Th.	15	6	7	4	20	8	6	4	49	8	4	3	32	20	5	4	5	20	0	10	40	15	9	11	9	15	5		
F.	16	6	55	5	22	8	3	5	57	8	3	4	40	19	10	5	19	20	0	11	40	15	6	—	—	—	—		
S.	17	7	44	6	34	8	3	7	10	8	4	6	1	20	3	6	39	20	9	0	15	15	7	0	52	15	11		
S.	18	8	35	7	44	8	6	8	16	8	9	7	13	21	5	7	45	22	3	1	33	16	6	2	8	17	2		
M.	19	9	28	8	47	9	0	9	15	9	2	8	13	23	1	8	39	23	11	2	41	18	0	3	11	18	10		
Tu.	20	10	25	9	42	9	5	10	6	9	7	9	3	24	9	9	26	25	7	3	40	19	7	4	7	20	4		
W.	21	11	24	10	31	9	9	10	57	9	11	9	47	26	3	10	11	26	10	4	33	21	0	5	0	21	8		
Th.	22	morn.		11	23	10	0	11	48	10	1	10	36	27	3	11	0	27	7	5	28	22	1	5	52	22	5		
F.	23	0	25	—	—	—	—	0	14	10	2	11	25	27	10	11	50	27	11	6	17	22	8	6	42	22	9		
S.	24	1	28	0	39	10	3	1	5	10	3	—	—	—	—	0	15	27	9	7	5	22	7	7	29	22	3		
S.	25	2	29	1	30	10	2	1	54	10	1	0	39	27	6	1	3	26	11	7	54	21	10	8	19	21	3		
M.	26	3	29	2	18	9	11	2	42	9	9	1	27	26	3	1	52	25	6	8	44	20	8	9	8	20	0		
Tu.	27	4	24	3	6	9	7	3	31	9	5	2	17	24	9	2	42	23	11	9	32	19	3	9	56	18	7		
W.	28	5	16	3	57	9	2	4	23	9	0	3	8	23	1	3	35	22	4	10	20	17	11	10	44	17	2		
Th.	29	6	5	4	50	8	10	5	21	8	8	4	5	21	8	4	38	21	1	11	9	16	7	11	39	16	2		
F.	30	6	52	5	54	8	6	6	28	8	4	5	16	20	9	5	55	20	8	—	—	—	—	0	11	16	0		
Half Mean Spring } Range.						4ft. 10in.						13ft. 0in.						10ft. 6in.											

<i>Phases of the Moon.</i>				<i>Moon's Declination at Noon.</i>															
	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
New - - - - -	7	10	25	Morning.	1	8	N.20		9	17	S. 11		17	3	S. 38		25	17	N.36
First Quarter -	15	2	7	Afternoon.	2	4	35		10	18	8		18	0	N.41		26	15	41
Full - - - - -	22	10	15	Morning.	3	0	42		11	18	18		19	5	6		27	12	53
Last Quarter -	29	3	5	Morning.	4	3	S. 10		12	17	39		20	9	22		28	9	29
					5	6	51		13	16	13		21	13	9		29	5	44
In Apogee - -	9	0	0	Noon.	6	10	13		14	14	1		22	16	5		30	1	48
In Perigee - -	22	4	0	Afternoon.	7	13	8		15	11	8		23	17	53				
					8	15	29		16	7	38		24	18	23				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | **LIVERPOOL** add 12 m. | **PEMBROKE** add 20 m.

NOVEMBER, 1866.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
Th.	1	0 50 29 3	1 31 29 5	5 3 12 11	5 42 13 1	5 53 9 0	6 29 9 1	23.8						
F.	2	2 10 29 8	2 46 30 3	6 17 13 3	6 48 13 6	7 4 9 3	7 35 9 5	24.8						
S.	3	3 23 31 0	3 55 31 10	7 17 13 9	7 42 14 1	8 7 9 7	8 34 9 9	25.8						
S.	4	4 23 32 8	4 50 33 5	8 4 14 5	8 25 14 8	9 0 9 11	9 23 10 1	26.8						
M.	5	5 13 34 2	5 35 34 10	8 43 14 11	9 1 15 2	9 43 10 3	10 1 10 5	27.8						
Tu.	6	5 55 35 3	6 15 35 7	9 18 15 3	9 35 15 5	10 17 10 6	10 33 10 7	28.8						
W.	7	6 33 35 9	6 51 35 11	9 51 15 6	10 7 15 6	10 49 10 8	11 5 10 9	●						
Th.	8	7 8 36 0	7 24 36 0	10 22 15 6	10 37 15 5	11 21 10 9	11 38 10 8	1.1						
F.	9	7 39 35 9	7 55 35 6	10 52 15 4	11 7 15 2	11 54 10 6	—	2.1						
S.	10	8 11 35 2	8 25 34 10	11 23 15 0	11 40 14 10	0 11 10 5	0 27 10 4	3.1						
S.	11	8 40 34 4	8 56 33 10	11 58 14 7	—	0 44 10 2	1 1 10 0	4.1						
M.	12	9 12 33 3	9 29 32 6	0 18 14 4	0 39 14 0	1 19 9 10	1 38 9 8	5.1						
Tu.	13	9 45 31 10	10 2 31 1	1 0 13 8	1 21 13 5	1 59 9 6	2 21 9 5	6.1						
W.	14	10 20 30 4	10 41 29 7	1 44 13 2	2 9 12 11	2 43 9 3	3 8 9 1	7.1						
Th.	15	11 9 29 0	11 42 28 7	2 37 12 8	3 12 12 6	3 35 8 11	4 10 8 10	8.1						
F.	16	—	0 16 28 6	3 49 12 5	4 28 12 6	4 45 8 9	5 20 8 9	9.1						
S.	17	0 53 28 10	1 30 29 5	5 7 12 9	5 41 13 1	5 55 8 11	6 28 9 2	10.1						
S.	18	2 6 30 3	2 41 31 3	6 13 13 5	6 42 13 10	7 0 9 5	7 30 9 8	11.1						
M.	19	3 15 32 4	3 48 33 7	7 9 14 4	7 35 14 10	7 59 9 11	8 27 10 2	12.1						
Tu.	20	4 19 34 10	4 47 36 1	7 59 15 4	8 21 15 9	8 55 10 5	9 20 10 9	13.1						
W.	21	5 14 37 2	5 42 38 3	8 43 16 2	9 6 16 7	9 42 11 0	10 4 11 2	14.1						
Th.	22	6 9 39 0	6 35 39 5	9 30 16 10	9 53 17 0	10 27 11 5	10 50 11 7	15.1						
F.	23	7 0 39 10	7 25 40 1	10 16 17 2	10 38 17 2	11 14 11 7	11 38 11 7	16.1						
S.	24	7 49 39 10	8 12 39 6	11 1 17 0	11 25 16 10	—	0 3 11 6	17.1						
S.	25	8 35 38 11	8 58 38 1	11 51 16 6	—	0 29 11 4	0 55 11 2	18.1						
M.	26	9 20 37 2	9 42 36 0	0 18 16 1	0 45 15 8	1 21 10 11	1 46 10 7	19.1						
Tu.	27	10 3 34 9	10 24 33 7	1 13 15 2	1 41 14 8	2 13 10 4	2 40 10 1	20.1						
W.	28	10 47 32 5	11 12 31 4	2 9 14 3	2 39 13 10	3 8 9 10	3 37 9 7	21.1						
Th.	29	11 41 30 5	—	3 11 13 5	3 46 13 2	4 10 9 4	4 44 9 2	22.1						
F.	30	0 14 29 9	0 48 29 5	4 25 13 0	5 2 13 0	5 18 9 1	5 51 9 0	23.1						
Half Mean Spring } Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	16 18		9	16 2		17	14 52		25	12 51	
2	16 19		10	15 56		18	14 40		26	12 32	
3	16 19		11	15 50		19	14 27		27	12 12	
4	16 18		12	15 42		20	14 13		28	11 52	
5	16 17		13	15 34		21	13 58		29	11 31	
6	16 14		14	15 25		22	13 42		30	11 10	
7	16 11		15	15 15		23	13 26				
8	16 7		16	15 4		24	13 9				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 12 m. | KINGSTOWN subtract 1 m. for Dublin Time.

NOVEMBER, 1866.

WEEK DAY.			MONTH DAY.			MOON'S 'TRANSIT.			BELFAST.								LONDONDERRY.								SLIGO BAY.																						
									MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																		
									Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.																
									H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.															
Th.	1	7m21	5	33	8	2	6	12	8	2	3	11	6	0	3	46	6	2	0	8	8	7	0	46	8	8																					
F.	2	8 8	6	49	8	2	7	21	8	3	4	16	6	3	4	42	6	5	1	22	8	9	1	54	8	11																					
S.	3	8 53	7	51	8	5	8	16	8	7	5	7	6	7	5	28	6	9	2	24	9	2	2	47	9	6																					
S.	4	9 38	8	38	8	9	8	59	8	11	5	48	6	11	6	9	7	0	3	8	9	9	3	27	10	0																					
M.	5	10 22	9	18	9	1	9	37	9	2	6	29	7	2	6	49	7	3	3	45	10	3	4	3	10	6																					
Tu.	6	11 6	9	55	9	3	10	11	9	3	7	7	7	4	7	25	7	5	4	21	10	8	4	38	10	9																					
W.	7	11 51	10	28	9	3	10	44	9	3	7	42	7	5	7	57	7	6	4	56	10	10	5	13	10	11																					
Th.	8	0a36	11	0	9	3	11	15	9	3	8	12	7	6	8	27	7	5	5	30	10	11	5	45	10	10																					
F.	9	1 22	11	30	9	2	11	46	9	2	8	41	7	3	8	56	7	2	6	0	10	8	6	16	10	6																					
S.	10	2 9	—	—	—	—	0	2	9	1	9	12	7	0	9	26	6	10	6	32	10	4	6	48	10	2																					
S.	11	2 57	0	19	9	0	0	37	8	11	9	41	6	9	9	58	6	7	7	5	9	11	7	22	9	7																					
M.	12	3 44	0	56	8	10	1	17	8	9	10	17	6	5	10	38	6	2	7	40	9	4	8	1	9	1																					
Tu.	13	4 32	1	40	8	8	2	3	8	6	11	3	6	0	11	31	5	9	8	23	8	10	8	46	8	8																					
W.	14	5 20	2	26	8	5	2	51	8	3	—	—	—	—	0	4	5	7	9	14	8	6	9	45	8	4																					
Th.	15	6 7	3	19	8	2	3	52	8	1	0	39	5	6	1	18	5	5	10	21	8	3	10	58	8	2																					
F.	16	6 55	4	27	8	1	5	2	8	1	2	1	5	5	2	39	5	7	11	35	8	3	—	—	—	—																					
S.	17	7 44	5	37	8	1	6	11	8	2	3	15	5	10	3	45	6	2	0	11	8	5	0	45	8	8																					
S.	18	8 35	6	45	8	3	7	16	8	5	4	13	6	5	4	37	6	8	1	18	8	11	1	48	9	3																					
M.	19	9 28	7	44	8	7	8	9	8	10	4	59	6	11	5	21	7	2	2	16	9	8	2	40	10	0																					
Tu.	20	10 25	8	33	9	1	8	56	9	3	5	43	7	5	6	6	7	7	3	3	10	5	3	23	10	10																					
W.	21	11 24	9	19	9	6	9	42	9	8	6	29	7	10	6	54	8	0	3	44	11	2	4	8	11	6																					
Th.	22	morn.	10	6	9	10	10	29	9	10	7	19	8	2	7	43	8	3	4	32	11	10	4	57	12	0																					
F.	23	0 25	10	53	9	11	11	16	9	10	8	6	8	4	8	28	8	4	5	22	12	1	5	46	12	1																					
S.	24	1 28	11	39	9	10	—	—	—	—	8	50	8	3	9	13	8	1	6	9	11	11	6	34	11	9																					
S.	25	2 29	0	4	9	9	0	30	9	8	9	36	7	10	10	0	7	7	7	0	11	5	7	24	11	0																					
M.	26	3 29	0	57	9	6	1	24	9	4	10	25	7	4	10	52	7	0	7	49	10	7	8	14	10	2																					
Tu.	27	4 24	1	53	9	2	2	23	9	0	11	24	6	8	11	59	6	4	8	42	9	9	9	13	9	5																					
W.	28	5 16	2	52	8	9	3	21	8	7	—	—	—	—	0	37	6	1	9	46	9	2	10	20	8	11																					
Th.	29	6 5	3	52	8	5	4	25	8	4	1	16	5	11	1	58	5	10	10	56	8	9	11	32	8	8																					
F.	30	6 52	4	59	8	3	5	32	8	2	2	36	5	10	3	10	6	0	—	—	—	—	0	6	8	7																					
Half Mean Spring } Range.			4ft. 9in.								3ft. 10in.								5ft. 7in.																												
Phases of the Moon.																Moon's Declination at Noon.																															
D. H. M.																M.D.				° ' "				M.D.				° ' "				M.D.				° ' "				M.D.				° ' "			
New- - - - 7 10 25 Morning.																1				8 N.20				9				17 S. 11				17				38. 38				25				17 N.36			
First Quarter 15 2 7 Afternoon.																2				4 35				10				18 8				18				0 N.41				26				15 41			
Full - - - - 22 10 15 Morning.																3				0 42				11				18 18				19				5 6				27				12 53			
Last Quarter- 29 3 5 Morning.																4				3 S. 10				12				17 39				20				9 22				28				9 29			
																5				6 51				13				16 13				21				13 9				29				5 44			
In Apogee- - 9 0 0 Noon.																6				10 13				14				14 1				22				16 5				30				1 48			
In Perigee- - 22 4 0 Afternoon.																7				13 8				15				11 8				23				17 53											
																8				15 29				16				7 38				24				18 23											

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

NOVEMBER, 1866.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE. AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
Th.	1	11 58	11 3	—	—	11 56	9 4	—	—	—	—	0 10	10 1	23·8
F.	2	0 34	11 6	1 5	11 9	0 34	9 6	1 10	9 8	0 45	10 2	1 19	10 4	24·8
S.	3	1 35	12 1	1 59	12 6	1 45	9 10	2 14	10 1	1 54	10 7	2 25	10 11	25·8
S.	4	2 22	12 10	2 45	13 1	2 39	10 4	3 2	10 7	2 53	11 2	3 19	11 4	26·8
M.	5	3 5	13 4	3 23	13 8	3 24	10 10	3 45	11 0	3 42	11 7	4 4	11 9	27·8
Tu.	6	3 41	13 10	3 58	14 0	4 4	11 2	4 21	11 3	4 25	11 10	4 44	11 11	28·8
W.	7	4 15	14 2	4 31	14 3	4 39	11 4	4 57	11 5	5 2	12 0	5 18	12 0	●
Th.	8	4 48	14 3	5 5	14 3	5 14	11 5	5 31	11 4	5 35	12 0	5 52	12 0	1·1
F.	9	5 21	14 1	5 37	13 11	5 47	11 3	6 3	11 2	6 8	11 11	6 24	11 11	2·1
S.	10	5 53	13 9	6 9	13 6	6 19	11 1	6 35	10 11	6 40	11 10	6 56	11 9	3·1
S.	11	6 26	13 3	6 44	13 0	6 51	10 9	7 8	10 7	7 12	11 7	7 29	11 6	4·1
M.	12	7 3	12 8	7 25	12 4	7 26	10 4	7 45	10 2	7 46	11 4	8 3	11 1	5·1
Tu.	13	7 46	12 0	8 8	11 7	8 3	9 11	8 22	9 8	8 21	10 11	8 39	10 9	6·1
W.	14	8 33	11 3	8 58	10 11	8 44	9 6	9 7	9 4	8 59	10 6	9 23	10 4	7·1
Th.	15	9 31	10 9	10 6	10 7	9 34	9 2	10 6	9 1	9 54	10 1	10 28	9 11	8·1
F.	16	10 43	10 9	11 22	10 11	10 42	9 1	11 19	9 2	11 2	9 11	11 36	9 11	9·1
S.	17	11 57	11 3	—	—	11 55	9 4	—	—	—	—	0 8	10 1	10·1
S.	18	0 30	11 9	1 0	12 3	0 30	9 7	1 4	9 11	0 41	10 4	1 13	10 8	11·1
M.	19	1 27	12 9	1 52	13 3	1 37	10 3	2 7	10 7	1 46	11 0	2 18	11 5	12·1
Tu.	20	2 17	13 10	2 41	14 3	2 34	11 0	3 0	11 5	2 49	11 9	3 17	12 2	13·1
W.	21	3 4	14 9	3 28	15 2	3 25	11 9	3 51	12 1	3 44	12 6	4 12	12 9	14·1
Th.	22	3 52	15 7	4 16	15 10	4 16	12 4	4 41	12 6	4 39	13 0	5 3	13 1	○
F.	23	4 40	16 0	5 5	16 1	5 6	12 7	5 32	12 7	5 27	13 2	5 52	13 3	16·1
S.	24	5 30	16 0	5 55	15 9	5 57	12 7	6 21	12 5	6 17	13 3	6 42	13 2	17·1
S.	25	6 20	15 5	6 46	15 0	6 46	12 2	7 10	11 10	7 7	13 0	7 31	12 9	18·1
M.	26	7 12	14 6	7 38	14 0	7 35	11 7	7 59	11 3	7 54	12 6	8 17	12 3	19·1
Tu.	27	8 5	13 4	8 33	12 9	8 23	10 10	8 46	10 6	8 40	11 10	9 3	11 6	20·1
W.	28	9 2	12 2	9 31	11 9	9 11	10 2	9 37	9 10	9 26	11 2	9 53	10 10	21·1
Th.	29	10 4	11 5	10 40	11 3	10 5	9 7	10 39	9 5	10 27	10 6	11 0	10 3	22·1
F.	30	11 17	11 3	11 51	11 3	11 14	9 4	11 49	9 4	11 32	10 1	—	—	23·1

Half Mean Spring } 7ft. 5in. 5ft. 10in. 6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	18	Add.	9	16	2	Add.	17	14	52	Add.	25	12	51	Add.
2	16	19		10	15	56		18	14	40		26	12	32	
3	16	19		11	15	50		19	14	27		27	12	12	
4	16	18		12	15	42		20	14	13		28	11	52	
5	16	17		13	15	34		21	13	58		29	11	31	
6	16	14		14	15	25		22	13	42		30	11	10	
7	16	11		15	15	15		23	13	26					
8	16	7		16	15	4		24	13	9					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.						DEVONPORT.						PORTSMOUTH.					
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.		
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.	
			H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.	
S.	1	7m 37	11 25	14 4		—	—		0 18	12 3		0 56	12 11		6 37	10 3		7 12	10 4	
S.	2	8 21	0 1	14 6		0 30	14 10		1 32	12 8		2 6	13 3		7 49	10 6		8 20	10 9	
M.	3	9 4	0 59	15 3		1 24	15 8		2 34	13 3		3 1	13 8		8 50	10 11		9 16	11 2	
Tu.	4	9 49	1 45	16 0		2 6	16 5		3 26	13 9		3 50	14 0		9 39	11 4		10 1	11 6	
W.	5	10 34	2 25	16 10		2 43	17 2		4 13	14 1		4 33	14 3		10 20	11 8		10 39	11 9	
Th.	6	11 20	3 1	17 5		3 19	17 7		4 53	14 5		5 12	14 6		10 57	11 10		11 15	11 11	
F.	7	0a 7	3 36	17 8		3 54	17 9		5 30	14 9		5 47	14 7		11 32	11 11		11 50	12 0	
S.	8	0 54	4 12	17 9		4 29	17 9		6 4	14 11		6 22	14 6		—	—		0 8	12 0	
S.	9	1 42	4 44	17 8		5 0	17 7		6 38	14 11		6 51	14 4		0 26	11 11		0 43	11 11	
M.	10	2 29	5 17	17 5		5 34	17 3		7 6	14 8		7 22	14 0		1 0	11 10		1 18	11 10	
Tu.	11	3 17	5 51	17 1		6 11	16 10		7 39	14 4		7 57	13 7		1 35	11 9		1 53	11 8	
W.	12	4 4	6 31	16 6		6 51	16 1		8 14	14 0		8 31	13 2		2 12	11 6		2 32	11 5	
Th.	13	4 51	7 13	15 9		7 36	15 4		8 50	13 6		9 11	12 9		2 52	11 3		3 13	11 2	
F.	14	5 38	8 0	15 0		8 28	14 8		9 35	13 1		10 0	12 4		3 35	11 0		3 59	10 10	
S.	15	6 26	8 56	14 6		9 28	14 5		10 28	12 9		10 59	12 3		4 25	10 8		4 52	10 6	
S.	16	7 16	10 4	14 7		10 42	14 9		11 33	12 9		—	—		5 22	10 5		5 56	10 5	
M.	17	8 8	11 18	15 1		11 54	15 7		0 13	12 7		0 53	13 2		6 31	10 6		7 6	10 8	
Tu.	18	9 4	—	—		0 26	16 2		1 31	13 3		2 8	13 9		7 41	11 0		8 15	11 3	
W.	19	10 3	0 56	16 10		1 26	17 6		2 41	14 1		3 11	14 6		8 47	11 9		9 18	12 1	
Th.	20	11 5	1 53	18 3		2 19	18 11		3 41	14 10		4 10	15 2		9 47	12 5		10 14	12 8	
F.	21	morn.	2 44	19 6		3 11	20 1		4 38	15 7		5 6	15 9		10 4					

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	7	5	25	Morning.	1	2	S. 6	9	18	S. 3	17	7	N. 29	25	1	N. 3
First Quarter-	15	4	43	Morning.	2	5	52	10	16	50	18	11	25	26	7	17
Full - - - - -	21	8	34	Afternoon.	3	9	20	11	14	52	19	14	45	27	3	17
Last Quarter -	28	7	23	Afternoon.	4	12	24	12	12	11	20	17	9	28	0	S. 45
					5	14	56	13	8	55	21	18	21	29	4	38
In Apogee - -	6	2	0	Afternoon.	6	16	51	14	5	9	22	18	13	30	8	14
In Perigee - -	21	5	0	Morning.	7	18	3	15	1	3	23	16	49	31	11	27
					8	18	27	16	3	N. 14	24	14	20			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 BREST *add 18 m.* | DEVONPORT *add 17 m.* | PORTSMOUTH *add 4 m.*

DECEMBER, 1866.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
S.	1	6 4 14 . 9	6 38 14 11	7 54 13 4	8 29 13 6	9 20 16 2	9 55 16 2	24.1						
S.	2	7 15 15 2	7 45 15 6	9 4 13 8	9 38 13 10	10 29 16 2	11 2 16 3	25.1						
M.	3	8 15 15 9	8 39 16 1	10 7 14 0	10 34 14 3	11 34 16 5	—	26.1						
Tu.	4	9 2 16 4	9 24 16 7	10 58 14 6	11 19 14 8	0 1 16 8	0 26 16 11	27.1						
W.	5	9 44 16 10	10 5 17 11	11 39 14 10	11 57 15 0	0 47 17 1	1 7 17 4	28.1						
Th.	6	10 25 17 3	10 44 17 4	—	0 16 15 2	1 28 17 7	1 46 17 9	29.1						
F.	7	11 3 17 5	11 23 17 6	0 34 15 3	0 52 15 4	2 4 17 11	2 22 18 1	30.1						
S.	8	11 42 17 6	—	1 9 15 4	1 26 15 5	2 40 18 2	2 56 18 3	1.3						
S.	9	0 1 17 7	0 18 17 7	1 44 15 4	2 1 15 4	3 13 18 4	3 28 18 4	2.3						
M.	10	0 36 17 6	0 55 17 5	2 16 15 3	2 31 15 2	3 45 18 4	4 2 18 3	3.3						
Tu.	11	1 13 17 4	1 32 17 3	2 47 15 1	3 3 15 0	4 19 18 2	4 36 18 1	4.3						
W.	12	1 52 17 1	2 13 16 10	3 21 14 10	3 41 14 8	4 53 17 11	5 11 17 10	5.3						
Th.	13	2 34 16 7	2 55 16 4	4 1 14 6	4 22 14 3	5 32 17 8	5 53 17 5	6.3						
F.	14	3 16 16 1	3 39 15 10	4 48 14 1	5 7 13 11	6 13 17 3	6 36 17 0	7.3						
S.	15	4 4 15 6	4 30 15 3	5 32 13 9	6 2 13 7	7 2 16 10	7 31 16 8	8.3						
S.	16	4 58 15 1	5 28 15 1	6 34 13 5	7 8 13 5	8 4 16 6	8 38 16 5	9.3						
M.	17	5 59 15 2	6 32 15 6	7 46 13 6	8 23 13 9	9 13 16 5	9 48 16 6	10.3						
Tu.	18	7 7 16 0	7 41 16 6	8 58 14 0	9 31 14 4	10 22 16 9	10 58 17 0	11.3						
W.	19	8 12 17 1	8 41 17 7	10 2 14 9	10 31 15 2	11 31 17 3	12 0 17 8	12.3						
Th.	20	9 10 18 2	9 38 18 7	10 59 15 6	11 25 15 10	—	0 29 18 1	13.3						
F.	21	10 7 19 0	10 36 19 5	11 51 16 2	—	0 54 18 6	1 22 18 11	14.3						
S.	22	11 5 19 7	11 33 19 8	0 18 16 5	0 45 16 8	1 48 19 3	2 14 19 7	15.3						
S.	23	12 0 19 9	—	1 11 16 10	1 36 16 10	2 41 19 9	3 6 19 11	16.3						
M.	24	0 26 19 9	0 53 19 7	2 1 16 10	2 24 16 9	3 31 20 0	3 54 20 0	17.3						
Tu.	25	1 19 19 4	1 43 19 0	2 47 16 7	3 10 16 5	4 18 19 10	4 41 19 8	18.3						
W.	26	2 7 18 7	2 31 18 2	3 33 16 1	3 56 15 9	5 4 19 4	5 27 19 0	19.3						
Th.	27	2 56 17 7	3 18 17 1	4 20 15 5	4 44 15 0	5 51 18 7	6 14 18 3	20.3						
F.	28	3 40 16 7	4 2 16 1	5 8 14 7	5 33 14 3	6 39 17 10	7 2 17 5	21.3						
S.	29	4 25 15 6	4 49 15 0	5 59 13 11	6 26 13 7	7 28 17 0	7 55 16 8	22.3						
S.	30	5 17 14 8	5 46 14 5	6 57 13 3	7 32 13 2	8 24 16 4	8 57 16 1	23.3						
M.	31	6 17 14 5	6 50 14 6	8 7 13 1	8 42 13 2	9 31 15 11	10 6 15 10	24.3						
Half Mean Spring } Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.
1	10 47		9	7 27		17	3 40		25	0 19	
2	10 24		10	7 0		18	3 10		26	0 48	
3	10 1		11	6 32		19	2 40		27	1 18	
4	9 36		12	6 4		20	2 11		28	1 48	
5	9 12		13	5 36		21	1 41		29	2 17	
6	8 46		14	5 7		22	1 11		30	2 46	
7	8 20		15	4 38		23	0 41		31	3 15	
8	7 54		16	4 9		24	0 11				

be times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

DECEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	7 m 37	7 2	9 11	7 37	9 11	1 31	16 9	2 2	16 10	10 55	11 3	11 27	11
S.	2	8 21	8 11	10 0	8 44	10 2	2 33	17 0	3 6	17 4	11 58	11 7	—	—
M.	3	9 4	9 14	10 3	9 42	10 5	3 35	17 9	4 3	18 1	0 26	11 10	0 53	12
Tu.	4	9 49	10 7	10 7	10 29	10 9	4 27	18 5	4 47	18 8	1 17	12 5	1 40	12
W.	5	10 34	10 50	10 10	11 10	11 0	5 7	18 11	5 26	19 2	2 2	12 9	2 22	12 1
Th.	6	11 20	11 29	11 1	11 47	11 1	5 45	19 4	6 3	19 5	2 41	13 1	2 59	13
F.	7	on 7	—	—	0 5	11 2	6 22	19 6	6 40	19 7	3 15	13 4	3 32	13
S.	8	0 54	0 22	11 1	0 39	11 1	6 58	19 8	7 15	19 8	3 49	13 6	4 6	13
S.	9	1 42	0 56	11 1	1 14	11 0	7 33	19 8	7 49	19 8	4 23	13 7	4 38	13
M.	10	2 29	1 30	10 11	1 47	10 10	8 5	19 7	8 22	19 5	4 54	13 5	5 11	13
Tu.	11	3 17	2 4	10 9	2 21	10 8	8 39	19 3	8 57	19 0	5 29	13 1	5 48	13 1
W.	12	4 4	2 39	10 7	2 59	10 6	9 17	18 9	9 37	18 5	6 8	12 8	6 30	12
Th.	13	4 51	3 18	10 5	3 38	10 4	9 57	18 2	10 19	17 11	6 52	12 3	7 15	12
F.	14	5 38	3 59	10 2	4 21	10 1	10 44	17 7	11 13	17 4	7 39	11 11	8 5	11
S.	15	6 26	4 46	10 0	5 13	9 11	11 46	17 1	—	—	8 34	11 7	9 5	11
S.	16	7 16	5 42	9 11	6 14	9 11	0 19	16 11	0 52	16 11	9 39	11 5	10 15	11
M.	17	8 8	6 53	10 0	7 31	10 2	1 25	17 0	1 57	17 3	10 49	11 8	11 22	11 1
Tu.	18	9 4	8 5	10 4	8 38	10 6	2 28	17 8	3 0	18 3	11 52	12 3	—	—
W.	19	10 3	9 9	10 9	9 40	11 1	3 31	18 11	4 0	19 6	0 21	12 8	0 50	13
Th.	20	11 5	10 10	11 4	10 37	11 6	4 28	20 1	4 54	20 7	1 19	13 7	1 47	13 11
F.	21	morn.	11 3	11 9	11 30	11 11	5 20	21 0	5 47	21 5	2 15	14 3	2 42	14
S.	22	0 7	11 57	12 1	—	—	6 15	21 8	6 42	21 10	3 8	14 10	3 34	15
S.	23	1 10	0 24	12 1	0 49	12 1	7 8	22 0	7 33	22 0	3 59	15 2	4 23	15
M.	24	2 9	1 14	12 0	1 38	11 11	7 57	21 11	8 21	21 9	4 47	15 2	5 11	14 1
Tu.	25	3 5	2 3	11 10	2 27	11 8	8 45	21 5	9 8	20 11	5 35	14 8	5 59	14
W.	26	3 58	2 50	11 5	3 14	11 3	9 32	20 5	9 55	19 10	6 23	13 10	6 49	13
Th.	27	4 47	3 37	11 0	4 1	10 9	10 19	19 3	10 44	18 9	7 15	13 1	7 40	12
F.	28	5 33	4 23	10 7	4 46	10 4	11 11	18 2	11 40	17 8	8 5	12 4	8 30	11 1
S.	29	6 18	5 11	10 2	5 36	10 0	—	—	0 11	17 2	8 58	11 7	9 28	11
S.	30	7 2	6 4	9 10	6 38	9 9	0 42	16 9	1 13	16 6	10 3	11 1	10 36	11
M.	31	7 47	7 14	9 9	7 49	9 9	1 44	16 4	2 15	16 4	11 8	11 0	11 39	11

Half Mean Spring } 5 ft. 9 in.
Range.

10 ft. 5 in.

7 ft. 2 in.

Phases of the Moon.

	D.	H.	M.	
New	7	5	25	Morning.
First Quarter	15	4	43	Morning.
Full	21	8	34	Afternoon.
Last Quarter	28	7	23	Afternoon.
In Apogee	6	2	0	Afternoon.
In Perigee	21	5	0	Morning.

Moon's Declination at Noon.

M. D.	°	'
1	28	6
2	5	52
3	9	20
4	12	24
5	14	56
6	16	51
7	18	3
8	18	27

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

HARWICH subtract 6 m.

HULL add 1 m.

SUNDERLAND add 5 m.

BRITISH AND IRISH PORTS.

DECEMBER, 1866.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.		D.
	1	11 7 10 4	11 40 10 5	10 2 12 11	10 34 13 0	4 0 9 9	4 34 9 9	24	1					
	2	— — — —	0 12 10 7	11 6 13 2	11 33 13 5	5 7 9 10	5 35 10 1	25	1					
	3	0 39 10 9	1 5 11 0	11 59 13 8	— — — —	6 1 10 4	6 22 10 8	26	1					
	4	1 27 11 2	1 47 11 4	0 21 13 11	0 41 14 2	6 40 11 0	6 57 11 4	27	1					
	5	2 6 11 7	2 25 11 10	1 1 14 6	1 20 14 9	7 14 11 8	7 30 11 11	28	1					
	6	2 42 12 0	2 59 12 1	1 39 15 0	1 57 15 2	7 46 12 1	8 2 12 3	29	1					
	7	3 16 12 3	3 33 12 4	2 14 15 3	2 31 15 4	8 19 12 4	8 35 12 4	30	1					
	8	3 50 12 5	4 7 12 5	2 47 15 5	3 3 15 5	8 52 12 4	9 9 12 3	31	1					
	9	4 25 12 4	4 41 12 3	3 20 15 4	3 36 15 2	9 25 12 2	9 42 12 1	2	3					
	10	4 58 12 1	5 15 12 0	3 53 15 1	4 10 14 11	10 0 11 11	10 18 11 9	3	3					
	11	5 33 11 10	5 52 11 9	4 28 14 10	4 46 14 8	10 37 11 6	10 57 11 4	4	3					
	12	6 12 11 7	6 33 11 5	5 6 14 6	5 28 14 4	11 19 11 1	11 42 10 10	5	3					
	13	6 54 11 3	7 17 11 0	5 50 14 1	6 14 13 10	— — — —	0 5 10 8	6	3					
	14	7 43 10 9	8 11 10 6	6 39 13 7	7 5 13 4	0 30 10 5	0 57 10 3	7	3					
	15	8 42 10 4	9 15 10 3	7 37 13 2	8 10 13 1	1 27 10 1	2 0 10 0	8	3					
	16	9 52 10 3	10 27 10 5	8 44 13 0	9 21 13 1	2 37 9 11	3 16 10 0	9	3					
	17	11 1 10 8	11 35 10 11	9 56 13 4	10 28 13 7	3 55 10 2	4 27 10 4	10	3					
	18	— — — —	0 6 11 3	10 59 13 11	11 28 14 4	5 1 10 7	5 30 11 0	11	3					
	19	0 35 11 7	1 2 11 11	11 56 14 9	— — — —	5 58 11 5	6 23 12 0	12	3					
	20	1 28 12 4	1 54 12 9	0 22 15 3	0 48 15 9	6 46 12 7	7 8 13 1	13	3					
	21	2 19 13 2	2 44 13 6	1 14 16 3	1 40 16 7	7 31 13 7	7 55 13 11	14	3					
	22	3 9 13 9	3 34 13 11	2 7 17 0	2 32 17 2	8 20 14 1	8 44 14 2	15	3					
	23	3 59 14 0	4 24 14 1	2 56 17 3	3 20 17 2	9 9 14 2	9 34 14 0	16	3					
	24	4 49 13 11	5 15 13 8	3 44 17 0	4 9 16 9	9 59 13 9	10 24 13 6	17	3					
	25	5 39 13 5	6 3 13 1	4 33 16 6	4 57 16 2	10 48 13 1	11 13 12 7	18	3					
	26	6 27 12 9	6 52 12 5	5 21 15 10	5 47 15 5	11 39 12 2	— — — —	19	3					
	27	7 17 12 0	7 43 11 7	6 13 14 11	6 39 14 5	0 5 11 9	0 31 11 3	20	3					
	28	8 10 11 2	8 38 10 9	7 4 14 0	7 32 13 7	0 56 10 11	1 22 10 6	21	3					
	29	9 7 10 5	9 39 10 2	8 1 13 3	8 32 12 11	1 52 10 2	2 24 9 10	22	3					
	30	10 14 10 0	10 47 9 11	9 8 12 8	9 42 12 7	3 0 9 8	3 37 9 6	23	3					
	31	11 20 10 0	11 52 10 1	10 14 12 7	10 46 12 8	4 12 9 5	4 46 9 5	24	3					
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

L.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.
1	10	47		9	7	27		17	3	40		25	0	19	
2	10	24		10	7	0		18	3	10		26	0	48	
3	10	1		11	6	32		19	2	40		27	1	18	
4	9	36		12	6	4		20	2	11		28	1	48	
5	9	12		13	5	36		21	1	41		29	2	17	
6	8	46		14	5	7		22	1	11		30	2	46	
7	8	20		15	4	38		23	0	41		31	3	15	
8	7	54		16	4	9		24	0	11					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—

NORTH SHIELDS add 6 m

LEITH add 13 m.

THURSO add 14 m.

DECEMBER, 1866.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.					
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
S.	1	7 m 37	7	3	8	4	7	38	8	4	6	32	20	8	7	7	20	11	0	45	15	11	1	24	16				
S.	2	8 21	8	13	8	5	8	43	8	7	7	41	21	3	8	11	21	7	2	4	16	3	2	35	16				
M.	3	9 4	9	12	8	8	9	37	8	9	8	37	22	0	9	0	22	6	3	7	17	1	3	33	17				
Tu.	4	9 49	9	59	8	10	10	21	8	11	9	21	22	10	9	41	23	3	3	57	17	11	4	21	18				
W.	5	10 34	10	41	9	0	11	2	9	1	9	59	23	7	10	17	23	10	4	44	18	8	5	6	19				
Th.	6	11 20	11	22	9	1	11	41	9	2	10	35	24	0	10	53	24	2	5	26	19	2	5	45	19				
F.	7	0 7	12	0	9	2	—	—	—	—	11	11	24	3	11	29	24	5	6	3	19	5	6	20	19				
S.	8	0 54	0	18	9	3	0	36	9	3	11	47	24	6	—	—	—	—	6	38	19	8	6	55	19				
S.	9	1 42	0	54	9	4	1	11	9	4	0	4	24	6	0	20	24	5	7	11	19	7	7	27	19				
M.	10	2 29	1	27	9	4	1	43	9	3	0	37	24	4	0	54	24	2	7	44	19	4	8	1	19				
Tu.	11	3 17	2	0	9	3	2	18	9	3	1	11	23	11	1	28	23	7	8	19	18	11	8	39	18				
W.	12	4 4	2	37	9	2	2	56	9	1	1	47	23	3	2	6	22	11	8	58	18	5	9	17	18				
Th.	13	4 51	3	15	9	0	3	36	8	11	2	26	22	7	2	47	22	3	9	37	17	9	9	57	17				
F.	14	5 38	3	59	8	10	4	23	8	9	3	10	21	10	3	34	21	6	10	19	17	2	10	42	16				
S.	15	6 26	4	49	8	8	5	17	8	7	4	2	21	2	4	33	20	11	11	6	16	6	11	34	16				
S.	16	7 16	5	48	8	6	6	22	8	6	5	8	20	10	5	46	21	0	—	—	—	0	5	16					
M.	17	8 8	6	57	8	6	7	32	8	7	6	26	21	4	7	1	21	9	0	38	16	6	1	16	16				
Tu.	18	9 4	8	6	8	9	8	38	9	0	7	34	22	5	8	6	23	1	1	55	17	4	2	30	18				
W.	19	10 3	9	9	9	2	9	39	9	4	8	34	23	10	9	1	24	7	3	4	18	8	3	37	19				
Th.	20	11 5	10	7	9	6	10	35	9	8	9	27	25	4	9	53	26	0	4	8	20	2	4	38	20				
F.	21	morn.	11	4	9	9	11	33	9	11	10	19	26	5	10	46	26	11	5	8	21	4	5	38	21				
S.	22	0 7	—	—	—	—	0	1	10	0	11	13	27	2	11	38	27	5	6	6	22	0	6	30	22				
S.	23	1 10	0	27	10	1	0	53	10	2	—	—	—	—	0	4	27	6	6	55	22	4	7	19	22				
M.	24	2 9	1	19	10	2	1	44	10	1	0	29	27	5	0	53	27	2	7	43	22	0	8	7	21				
Tu.	25	3 5	2	7	10	0	2	29	9	11	1	17	26	8	1	39	26	1	8	30	21	2	8	54	20				
W.	26	3 58	2	52	9	9	3	15	9	7	2	2	25	5	2	25	24	8	9	17	20	0	9	39	19				
Th.	27	4 47	3	38	9	5	4	0	9	3	2	48	24	0	3	11	23	4	10	0	18	9	10	21	18				
F.	28	5 33	4	23	9	1	4	46	8	11	3	34	22	7	3	58	21	10	10	41	17	5	11	2	16				
S.	29	6 18	5	11	8	8	5	38	8	6	4	26	21	2	4	56	20	7	11	26	16	2	11	54	15				
S.	30	7 2	6	10	8	4	6	42	8	3	5	31	20	3	6	7	20	1	—	—	—	0	23	15					
M.	31	7 47	7	15	8	2	7	49	8	2	6	45	20	2	7	20	20	3	0	58	15	5	1	35	15				
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}								13 ^{ft.} 0 ^{in.}								10 ^{ft.} 6 ^{in.}										

Half Mean Spring } 4^{ft.} 10^{in.}
Range.

13^{ft.} 0^{in.}

10^{ft.} 6^{in.}

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
New - - - - -	7	5	25	Morning.	1	2	S. 6		9	18	S. 3		17	7	N. 29		25	11	N. 3
First Quarter -	15	4	43	Morning.	2	5	52		10	16	50		18	11	25		26	7	17
Full - - - - -	21	8	34	Afternoon.	3	9	20		11	14	52		19	14	45		27	3	17
Last Quarter -	28	7	23	Afternoon.	4	12	24		12	12	11		20	17	9		28	0	S. 45
					5	14	56		13	8	55		21	18	21		29	4	38
In Apogee - -	6	2	0	Afternoon.	6	16	51		14	5	9		22	18	13		30	8	14
In Perigee - -	21	5	0	Morning.	7	18	3		15	1	3		23	16	49		31	11	27
					8	18	27		16	3	N. 14		24	14	20				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

DECEMBER, 1866.

WEEK DAY.		MONTH DAY.		WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.			D.
				H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
S.	1	1	23	29	4	1	59	29	6	5	35	13	0	6	8	13	2	6	22	9	1	6	54	9	2	24°	1	
S.	2	2	36	29	10	3	9	30	3	6	40	13	3	7	7	13	5	7	27	9	4	7	56	9	5	25°	1	
M.	3	3	42	30	10	4	11	31	6	7	33	13	8	7	56	13	11	8	24	9	7	8	49	9	8	26°	1	
Tu.	4	4	37	32	1	5	2	32	9	8	16	14	2	8	36	14	4	9	12	9	10	9	34	9	11	27°	1	
W.	5	5	25	33	4	5	47	33	10	8	54	14	6	9	12	14	9	9	54	10	1	10	11	10	2	28°	1	
Th.	6	6	7	34	2	6	27	34	5	9	30	14	10	9	47	14	11	10	27	10	3	10	44	10	4	29°	1	
F.	7	6	46	34	7	7	4	34	10	10	4	15	0	10	20	15	11	11	1	10	5	11	18	10	6	●		
S.	8	7	22	35	0	7	39	35	1	10	36	15	1	10	52	15	11	11	35	10	6	11	53	10	5	1°	3	
S.	9	7	54	35	0	8	10	34	11	11	6	15	0	11	23	14	11	—	—	0	9	10	4	2°	3			
M.	10	8	26	34	9	8	42	34	7	11	41	14	10	11	59	14	8	0	26	10	3	0	44	10	2	3°	3	
Tu.	11	8	59	34	3	9	16	34	0	—	—	—	—	0	18	14	6	1	2	10	1	1	21	10	0	4°	3	
W.	12	9	34	33	5	9	51	32	11	0	40	14	4	1	2	14	1	1	41	9	10	2	2	9	9	5°	3	
Th.	13	10	8	32	5	10	26	31	10	1	24	13	11	1	47	13	8	2	24	9	8	2	46	9	6	6°	3	
F.	14	10	46	31	3	11	10	30	8	2	11	13	6	2	38	13	4	3	10	9	5	3	36	9	4	7°	3	
S.	15	11	37	30	3	—	—	—	—	3	8	13	2	3	41	13	1	4	7	9	2	4	39	9	1	8°	3	
S.	16	0	8	30	0	0	41	30	0	4	17	13	0	4	53	13	2	5	12	9	1	5	45	9	2	9°	3	
M.	17	1	16	30	3	1	52	30	9	5	29	13	5	6	2	13	8	6	17	9	3	6	49	9	5	10°	3	
Tu.	18	2	28	31	6	3	4	32	5	6	33	14	0	7	2	14	4	7	20	9	8	7	51	9	11	11°	3	
W.	19	3	40	33	5	4	15	34	7	7	30	14	9	7	57	15	3	8	21	10	2	8	52	10	5	12°	3	
Th.	20	4	48	35	9	5	19	36	10	8	23	15	8	8	48	16	0	9	21	10	8	9	48	10	10	13°	3	
F.	21	5	49	37	8	6	19	38	5	9	14	16	4	9	40	16	8	10	13	11	1	10	37	11	3	○		
S.	22	6	48	38	9	7	14	39	2	10	5	16	9	10	29	16	10	11	2	11	5	11	27	11	5	15°	3	
S.	23	7	39	39	5	8	3	39	4	10	52	16	11	11	15	16	10	11	52	11	5	—	—	—	—	16°	3	
M.	24	8	27	39	0	8	49	38	7	11	40	16	8	—	—	—	0	17	11	4	0	43	11	3	17°	3		
Tu.	25	9	10	37	11	9	31	37	0	0	5	16	4	0	30	16	0	1	8	11	1	1	32	10	10	18°	3	
W.	26	9	52	36	0	10	12	34	11	0	55	15	8	1	21	15	2	1	56	10	7	2	21	10	4	19°	3	
Th.	27	10	30	33	11	10	48	32	10	1	47	14	9	2	12	14	4	2	46	10	1	3	11	9	11	20°	3	
F.	28	11	8	31	9	11	31	30	8	2	37	14	0	3	4	13	7	3	36	9	8	4	2	9	5	○		
S.	29	11	58	29	9	—	—	—	—	3	33	13	2	4	4	12	11	4	31	9	2	5	2	9	0	22°	3	
S.	30	0	29	29	1	1	1	28	8	4	41	12	9	5	15	12	8	5	33	8	11	6	4	8	10	23°	3	
M.	31	1	35	28	7	2	10	28	7	5	48	12	8	6	20	12	9	6	35	8	11	7	6	9	0	24°	3	
Half Mean Spring Range.				18ft. 7in.								8ft. 0in.								5ft. 6in.								

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.
1	10	47		9	7	27		17	3	40		25	0	19	
2	10	24		10	7	0		18	3	10		26	0	48	
3	10	1		11	6	32		19	2	40		27	1	18	
4	9	36		12	6	4		20	2	11		28	1	48	
5	9	12		13	5	36		21	1	41		29	2	17	
6	8	46		14	5	7		22	1	11		30	2	46	
7	8	20		15	4	38		23	0	41		31	3	15	
8	7	54		16	4	9		24	0	11					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m. HOLYHEAD add 18 m. KINGSTOWN subtract 1 m. for Dublin Time.

DECEMBER, 1866.																
WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.					
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	7m 37	6 5	8 2	6 39	8 2	3 41	6 1	4 9	6 3	0 39	8 7	1 13	8 8		
S.	2	8 21	7 13	8 2	7 41	8 3	4 36	6 4	4 59	6 5	1 46	8 9	2 14	8 11		
M.	3	9 4	8 7	8 5	8 30	8 7	5 21	6 6	5 41	6 8	2 39	9 2	3 1	9 5		
Tu.	4	9 49	8 51	8 8	9 11	8 10	6 1	6 9	6 21	6 10	3 20	9 7	3 38	9 10		
W.	5	10 34	9 29	8 11	9 48	9 0	6 40	6 11	7 0	7 0	3 56	10 3	4 14	10 2		
Th.	6	11 20	10 6	9 1	10 23	9 1	7 19	7 1	7 37	7 1	4 32	10 3	4 50	10 5		
F.	7	0a 7	10 40	9 2	10 57	9 2	7 54	7 2	8 10	7 3	5 8	10 6	5 26	10 7		
S.	8	0 54	11 13	9 1	11 30	9 1	8 26	7 3	8 42	7 2	5 43	10 7	6 0	10 6		
S.	9	1 42	11 45	9 0	—	—	8 56	7 1	9 11	7 0	6 15	10 5	6 32	10 4		
M.	10	2 29	0 2	9 0	0 20	9 0	9 27	6 11	9 43	6 10	6 49	10 2	7 6	10 0		
Tu.	11	3 17	0 38	9 0	0 57	8 11	10 0	6 8	10 20	6 7	7 24	9 10	7 43	9 7		
W.	12	4 4	1 18	8 10	1 41	8 9	10 41	6 5	11 6	6 3	8 3	9 5	8 25	9 2		
Th.	13	4 51	2 5	8 8	2 29	8 7	11 32	6 1	—	—	8 48	9 0	9 15	8 11		
F.	14	5 38	2 54	8 6	3 20	8 5	0 1	5 11	0 34	5 9	9 44	8 9	10 17	8 8		
S.	15	6 26	3 49	8 4	4 20	8 4	1 11	5 9	1 49	5 9	10 50	8 7	11 25	8 8		
S.	16	7 16	4 53	8 3	5 26	8 3	2 29	5 10	3 4	6 0	12 0	8 9	—	—		
M.	17	8 8	5 59	8 3	6 33	8 4	3 36	6 3	4 5	6 6	0 34	8 11	1 7	9 1		
Tu.	18	9 4	7 6	8 5	7 36	8 7	4 30	6 9	4 54	6 11	1 39	9 4	2 9	9 8		
W.	19	10 3	8 4	8 10	8 31	9 1	5 18	7 2	5 42	7 4	2 36	10 0	3 1	10 4		
Th.	20	11 5	8 57	9 3	9 23	9 5	6 7	7 7	6 33	7 9	3 26	10 9	3 50	11 1		
F.	21	morn.	9 49	9 7	10 16	9 9	7 1	7 11	7 30	8 0	4 16	11 4	4 43	11 8		
S.	22	0 7	10 42	9 9	11 6	9 9	7 56	8 2	8 19	8 3	5 11	11 10	5 36	11 11		
S.	23	1 10	11 30	9 9	11 53	9 9	8 42	8 3	9 5	8 1	6 0	11 11	6 23	11 9		
M.	24	2 9	—	—	0 19	9 8	9 28	7 11	9 50	7 9	6 49	11 7	7 13	11 3		
Tu.	25	3 5	0 44	9 7	1 8	9 6	10 12	7 6	10 35	7 3	7 36	10 11	7 59	10 7		
W.	26	3 58	1 33	9 4	2 0	9 2	11 0	7 0	11 28	6 9	8 22	10 2	8 47	9 10		
Th.	27	4 47	2 28	9 0	2 54	8 10	11 58	6 5	—	—	9 14	9 6	9 42	9 3		
F.	28	5 33	3 19	8 8	3 45											

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

DECEMBER, 1866.

S.	WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.		D.
1	—	—	0 25	11 4	—	—	0 24	9 5	0 3	10 0	0 35	10 2	24·1		
2	0 58	11 6	1 25	11 9	1 0	9 6	1 32	9 7	1 8	10 3	1 40	10 4	25·1		
3	1 50	12 0	2 13	12 4	2 3	9 9	2 29	10 0	2 13	10 7	2 41	10 9	26·7		
4	2 35	12 7	2 57	12 9	2 52	10 2	3 15	10 4	3 6	10 11	3 31	11 1	27·1		
5	3 16	13 0	3 34	13 2	3 35	10 6	3 56	10 8	3 54	11 3	4 16	11 5	28·1		
6	3 52	13 4	4 10	13 6	4 15	10 9	4 33	10 11	4 37	11 6	5 56	11 7	29·1		
7	4 27	13 8	4 44	13 9	4 52	11 0	5 10	11 1	5 14	11 7	5 31	11 8	●		
8	5 1	13 10	5 19	13 10	5 28	11 1	5 46	11 1	5 48	11 9	6 5	11 9	1·3		
9	5 36	13 9	5 53	13 8	6 2	11 0	6 19	11 0	6 22	11 9	6 40	11 9	2·3		
10	6 10	13 6	6 27	13 5	6 36	10 11	6 53	10 10	6 57	11 8	7 14	11 8	3·3		
11	6 46	13 3	7 6	13 0	7 11	10 8	7 30	10 7	7 31	11 7	7 49	11 6	4·3		
12	7 27	12 9	7 49	12 6	7 49	10 5	8 8	10 3	8 8	11 5	8 26	11 3	5·3		
13	8 11	12 3	8 35	11 11	8 27	10 1	8 48	9 11	8 45	11 1	9 5	10 11	6·3		
14	9 0	11 8	9 28	11 5	9 11	9 9	9 35	9 8	9 26	10 10	9 52	10 8	7·3		
15	9 59	11 4	10 33	11 4	10 1	9 6	10 32	9 6	10 22	10 5	10 54	10 4	8		
16	11 9	11 5	11 45	11 8	11 7	9 6	11 42	9 7	11 26	10 4	11 58	10 4	9·3		
17	—	—	0 19	11 11	—	—	0 17	9 9	—	—	0 30	10 6	10·3		
18	0 51	12 4	1 20	12 9	0 52	10 0	1 27	10 3	1 2	10 9	1 35	11 0	11·3		
19	1 48	13 3	2 16	13 9	2 0	10 7	2 31	10 11	2 10	11 4	2 45	11 9	12·3		
20	2 43	14 2	3 10	14 7	3 1	11 3	3 30	11 7	3 17	12 1	3 48	12 4	13·3		
21	3 36	14 11	4 3	15 4	3 58	11 11	4 26	12 2	4 18	12 7	4 49	12 10	○		
22	4 29	15 7	4 54	15 9	4 53	12 3	5 19	12 5	5 17	12 11	5 41	13 0	15·3		
23	5 19	15 10	5 44	15 9	5 45	12 5	6 11	12 5	6 6	13 1	6 31	13 1	16·3		
24	6 9	15 6	6 33	15 3	6 36	12 3	6 59	12 1	6 56	13 0	7 20	12 10	17·3		
25	6 57	14 10	7 21	14 5	7 22	11 10	7 45	11 6	7 42	12 8	8 4	12 5	18·3		
26	7 46	14 0	8 12	13 6	8 7	11 3	8 29	10 11	8 26	12 2	8 48	11 11	19·3		
27	8 36	12 11	9 1	12 4	8 51	10 7	9 13	10 3	9 8	11 7	9 27	11 3	20·3		
28	9 26	11 11	9 52	11 6	9 33	9 11	9 56	9 8	9 49	11 0	10 15	10 8	☾		
29	10 22	11 2	10 56	11 0	10 22	9 5	10 54	9 3	10 45	10 4	11 15	10 1	22·3		
30	11 30	10 11	—	—	11 27	9 1	—	—	11 45	9 11	—	—	23·3		
31	0 4	10 11	0 37	11 0	0 1	9 1	0 35	9 1	0 16	9 10	0 48	9 10	24·3		

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.
1	10 47		9	7 27		17	3 40		25	0 19	
2	10 24		10	7 0		18	3 10		26	0 48	
3	10 1		11	6 32		19	2 40		27	1 18	
4	9 36		12	6 4		20	2 11		28	1 48	
5	9 12		13	5 36		21	1 41		29	2 17	
6	8 46		14	5 7		22	1 11		30	2 46	
7	8 20		15	4 38		23	0 41		31	3 15	
8	7 54		16	4 9		24	0 11				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6 0	
	Add							Subtract						
Feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	3 0	2 11	2 7	2 1	1 6	0 9	0 0	0 9	1 6	2 1	2 7	2 11	3 0	
4	4 0	3 10	3 6	2 10	2 0	1 0	0 0	1 0	2 0	2 10	3 6	3 10	4 0	
5	5 0	4 10	4 4	3 6	2 6	1 3	0 0	1 3	2 6	3 6	4 4	4 10	5 0	
6	6 0	5 10	5 2	4 3	3 0	1 7	0 0	1 7	3 0	4 3	5 2	5 10	6 0	
7	7 0	6 9	6 1	4 11	3 6	1 10	0 0	1 10	3 6	4 11	6 1	6 9	7 0	
8	8 0	7 9	6 11	5 8	4 0	2 1	0 0	2 1	4 0	5 8	6 11	7 9	8 0	
9	9 0	8 8	7 9	6 4	4 6	2 4	0 0	2 4	4 6	6 4	7 9	8 8	9 0	
10	10 0	9 8	8 8	7 1	5 0	2 7	0 0	2 7	5 0	7 1	8 8	9 8	10 0	
11	11 0	10 8	9 6	7 9	5 6	2 10	0 0	2 10	5 6	7 9	9 6	10 8	11 0	
12	12 0	11 7	10 5	8 6	6 0	3 1	0 0	3 1	6 0	8 6	10 5	11 7	12 0	
13	13 0	12 7	11 3	9 2	6 6	3 4	0 0	3 4	6 6	9 2	11 3	12 7	13 0	
14	14 0	13 6	12 1	9 11	7 0	3 7	0 0	3 7	7 0	9 11	12 1	13 6	14 0	
15	15 0	14 6	13 0	10 7	7 6	3 11	0 0	3 11	7 6	10 7	13 0	14 6	15 0	
16	16 0	15 5	13 10	11 4	8 0	4 2	0 0	4 2	8 0	11 4	13 10	15 5	16 0	
17	17 0	16 5	14 9	12 0	8 6	4 5	0 0	4 5	8 6	12 0	14 9	16 5	17 0	
18	18 0	17 5	15 7	12 9	9 0	4 8	0 0	4 8	9 0	12 9	15 7	17 5	18 0	
19	19 0	18 4	16 5	13 5	9 6	4 11	0 0	4 11	9 6	13 5	16 5	18 4	19 0	
20	20 0	19 4	17 4	14 2	10 0	5 2	0 0	5 2	10 0	14 2	17 4	19 4	20 0	
21	21 0	20 3	18 2	14 10	10 6	5 5	0 0	5 5	10 6	14 10	18 2	20 3	21 0	
22	22 0	21 3	19 1	15 7	11 0	5 8	0 0	5 8	11 0	15 7	19 1	21 3	22 0	
23	23 0	22 3	19 11	16 3	11 6	5 11	0 0	5 11	11 6	16 3	19 11	22 3	23 0	
24	24 0	23 2	20 9	17 0	12 0	6 2	0 0	6 2	12 0	17 0	20 9	23 2	24 0	

RULE.—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to,

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions ; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 10th, A.M., at 2 h. after high water.

					Ft.	in.
Height of high water (by the tables)	-	-	-		19	6
Half mean spring range	-	-	-	-	13	0
						<hr/>
Height above the half-tide or mean level of the sea	-	=			6	6
Half mean spring range	-	-	-	-	13	0
By table (B) 6 ft. 6 in. gives	-	-	-	-	+	3 3
						<hr/>
Height of the tide above zero at 2 h. after high water	=				16	3

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 17th, P.M., at 4 h. after high water.

					Ft.	in.
Height of high water (by the tables)	-	-	-		28	0
Half mean spring range	-	-	-	-	13	0
						<hr/>
Height above the half-tide or mean level of the sea	-				15	0
Half mean spring range	-	-	-	-	13	0
By table (B) 15 ft. 0 in. gives	-	-	-	-	-	7 6
						<hr/>
Height of the tide above zero at 4 h. after high water	=				5	6

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 17th, P.M. at 5½ h. after high water.

					Ft.	in.
Height of high water (by the tables)	-	-	-		28	0
Half mean spring range	-	-	-	-	13	0
						<hr/>
Height above the half tide or mean level of the sea	-				15	0
Half mean spring range	-	-	-	-	13	0
By table (B) 15 ft. 0 in. at 5½ h. from high water	-				14	6
						<hr/>
Level of the tide <i>below</i> zero	-	-	-	-	1	6

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced: for example—The soundings on the chart of Liverpool are reduced to a zero 15 ft. below the mean level of the sea, whereas, the mean spring range for that place, as shown in the result of two years' observations

(1854 and 1855) of the Self-registering Tide Gauge at St. Georges Pier, being 26 ft. gives 13 ft. below the mean level of the sea;* consequently 2 ft. will have to be added to the results deduced from table (B.)

Thus, in Example I. On the chart of Liverpool 11 ft. being marked on the bar of the Victoria Channel, the actual depth over the bar at 2h. after high water would be 16 ft. 3 in. + 11 ft. 0 in. + 2ft. 0 in.= 29ft. 3 in.

CORRECTIONS FOR CERTAIN DOCKS, &c.†

The depth at high water on the sills of the following Docks may be known, by applying to the standard high water heights given in the foregoing Tables the annexed correction according to the sign.

				Ft.	in.
<i>Falmouth</i>	Over the Sill of Graving Dock No. 1.	-	-	2	0
	Graving Dock No. 2.	-	-	0	0
	(applied to the heights given for Holyhead.)				
<i>Devonport</i>	Over the Sill of Basin	-	-	+15	3
<i>H. M. Dockyard.</i>	South Dock	-	-	+12	5
	New Long Dock	-	-	+16	8
	Old North Dock	-	-	+4	11
	New North Dock	-	-	+5	2
<i>Keyham</i>	Entrance to Lock	-	-	+18	2
	Entrance to North Basin	-	-	+9	2
	No. 1 Dock	-	-	+8	2
	2 "	-	-	+5	2
	3 "	-	-	+9	2
<i>Plymouth</i>	Great Western Docks, Millbay.				
	Over the Sill of Floating Dock	-	-	+10	3
	Graving Dock	-	-	+11	9
	(applied to the heights given for Devonport.)				
<i>Portsmouth</i>	Over the Sill of No. 1 or South Dock	-	-	+6	8
<i>H. M. Dockyard.</i>	Entrance			+13	4
	No. 2			+10	4
	3	} Basin Dock	-	+12	5
	4		-	+13	0
	5		-	+6	10
	No. 6 or North Dock	-	-	+6	4
	Entrance			+12	2
	No. 7	} Steam Basin	-	+14	2
	8		-	+9	1
	9 at N. end of Slips			+8	1
	10 South "	-	-	+14	2
	11 Steam Basin	-	-	+14	2
<i>Portsmouth</i>	Over the Sill of the New Commercial Graving Dock	-	-	+4	10
<i>Sheerness</i>	Over the Invert at the				
<i>H. M. Dockyard.</i>	entrance			+9	8
	Sill of No. 1 Dock	} Great Basin -	-	+9	2
	2 "		-	+9	2
	3 "		-	+9	2
	No. 4 Dock	} Boat Basin -	-	+3	10
	5 "		-	-1	4

* The datum mark at Liverpool is the level of the Old Dock Sill. From the two years' observations above alluded to, this datum mark is 5 ft. below the half tide or mean level of the sea, and consequently 8 ft. above the zero of these Tables.
† As it is desirable that the information here given should be accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

						Ft.	in.
Chatham —Over the Sill of No. 1 Dock	-	-	-	-	-	—	3 11
H. M. Dockyard.	"	2	"	-	-	+	3 5
	"	3	"	-	-	+	3 4
	"	4	"	-	-	+	0 5
(applied to the Heights given for London.)							
Woolwich —Over the Sill at the entrance of Outer Basin	-	-	-	-	-	+	3 7
H. M. Dockyard.	"					+	1 10
	"			No. 1 Dock	-	+	2 10
	"			2 "	-	+	1 10
	"			3 "	-	+	1 10
(applied to the heights given for London.)							
Deptford —Over the Sill of Outer Dock	-	-	-	-	-	—	4 2
H. M. Dockyard.	"			Inner Dock	-	—	6 2
(applied to the Heights given for London.)							
London —Over the Sill of St. Katherine Dock	-	-	-	-	-	+	8 9
"				London Dock, Hermitage Entr.	-	+	0 10
"	"			Wapping "	-	+	3 9
"	"			Shadwell, Upper	-	+	6 2
"	"			" Lower	-	+	8 10
"				Grand Surrey Dock	-	+	7 10
"				Surrey Canal and Dock	-	—	0 2
"				New Commercial Dock, Upper	}	—	1 3
				Entrance			
"				Regent's Canal and Dock	-	—	0 8
"				West India Dock, Limehouse	}	+	3 10
				Entrance			
"				City Canal or South West India	}	+	4 4
				Dock, Limehouse			
"				Commercial Dock, Upper, Lime-	}	—	0 8
				house Reach			
"				" " Lower "	-	+	7 10
"				City Canal or South West India	}	+	4 7
				Dock, Blackwall			
"				West India Dock, Blackwall	-	+	3 11
"				East India Dock "	-	+	5 4
"				Victoria London Dock "	-	+	8 10
Hull —Over the Sill of Humber Dock	-	-	-	-	-	+	4 3
Middlesbrough —Over the Sill of the Dock	-	-	-	-	-	+	4 1
(applied to the Heights given for Sunderland.)							
Hartlepool —Over the Sills of Victoria, West or Coal Dock,	}		-	-	-	+	6 8
Swainston and Jackson Docks							
(applied to the Heights given for Sunderland.)							
Sunderland —Over the Sill of Wearmouth Dock	-	-	-	-	-	+	6 0
"				South Dock, North Entrance	-	+	6 0
"	"			South Outlet,	}	+	8 0
	"			Inner Gates			
"				" Outer "	-	+	10 0
"				No. 1. Graving Dock	-	+	2 0
"				No. 2. "	-	+	2 0
Newcastle-upon-Tyne —Over the Sills of Northumberland	}		-	-	-	+	9 4
Dock and Basin							
"				Tyne Dock	-	+	10 1
(applied to the Heights given for North Shields.)							
Leith — Over the Sills of East and West Docks	-	-	-	-	-	+	0 7
				Sill of Victoria or New Dock	-	+	6 7
"				Prince of Wales Graving Dock	-	+	5 0
Cardiff —Over the Sill of East Dock	-	-	-	-	-	—	6 2
Bute Docks.	"			West Dock	-	—	9 2
(applied to the Heights given for Weston-super-mare.)							
Pembroke —Over the Sill of Dock Entrance	-	-	-	-	-	+	3 6
H. M. Dockyard.							

Liverpool—

		Ft.	in.
Over the Sill of North Carriers Dock, West Passage	—	2	0
„ „ South „ West Passage	—	2	0
„ Canada Half-tide Dock, W. Entrance	—	0	3
„ Northern West Lock Entrance	—	2	0
„ Southern West Lock Entrance	—	2	0
„ „ North Passage	—	5	0
„ „ South Passage	—	0	3
„ Canada Dock, South Passages, East	—	1	6
„ „ „ West	—	1	6
„ „ Lock	—	0	3
„ Huskisson Dock, East Lock	—	1	6
„ „ West „	—	2	0
„ Sandon Dock, West Entrance	—	1	6
„ Wellington Half-tide Dock, East Entrance	—	1	3
„ „ „ West „	—	1	6
„ Wellington Dock, West Passage	—	1	6
„ Bramley-Moore Dock, North Passage	—	2	0
„ „ South Passage	—	2	0
„ Nelson Dock, South Passage	—	1	6
„ Stanley Dock, West Passage	—	2	4
„ Collingwood Dock, West Passage	—	1	3
„ Salisbury Dock, West Entrances, North	—	1	1
„ „ „ South	—	1	1
„ Clarence Graving Dock Basin, N. Passage	—	3	3
„ „ „ S. Passage	—	3	6
„ Clarence Half-tide Dock, West Entrance	—	2	6
„ „ Dock, West Passage	—	4	10
„ Trafalgar Lock, North and South Passages	—	1	5
„ „ Dock, South Passage	—	3	1
„ Victoria Dock, South Passage	—	3	1
„ Waterloo Dock and Lock, North Passage	—	0	9
„ „ „ South Entrance	—	0	9
„ Princes Dock and Locks, North Entrance	—	0	9
„ „ „ South Entrance	—	0	9
„ Georges Dock and Passage, North Entrance	—	3	6
„ „ „ South Passage	—	3	6
„ Manchester Dock, West Entrance	—	8	3
„ „ Lock, West Entrance	—	4	0
„ Canning Dock, West Passage	—	1	11
„ „ Half-tide Basin, two West En- trances, each	—	1	9
„ Albert Dock, North Passage	—	1	8
„ „ East Passage	—	2	0
„ Salthouse Dock, North Passage	—	2	0
„ Wapping Basin, West Passage	—	2	0
„ „ North and South Passages, each	—	2	0
„ „ Dock, West Passage	—	2	0
„ „ „ South Passage	—	2	0
„ Kings Dock, South Passage	—	3	0
„ Queens Dock Basin, West Entrances, North	—	1	3
„ „ „ South	—	1	3
„ „ West Passage	—	2	0
„ „ South Passage	—	1	6
„ Coburg Dock, West Entrance	—	2	0
„ Brunswick Dock, North Passage	—	1	6
„ „ Half-tide Dock, East Passage	—	2	6
„ „ „ West Entrance	—	2	0
„ Toxteth Dock, West Entrance	—	3	0
„ Harrington Dock, West Entrance	—	6	10
„ Herculaneum, North Passage	—	0	6

<i>Liverpool</i> —continued :		Ft.	in.
Over the Sill of Herculanum, South Passage	- - -	0	6
" Garston Dock	- - -	2	0
" River Craft Dock, Lock, and Eagle Basin,	} - 8	3	
Outer Gates			
" " " " Inner	- - -	9	3
" Duke of Bridgewater's Dock, Outer Gates	- - -	3	6
" " " " Middle	- - -	8	6
" " " " Inner	- - -	2	0
" Canada Lock and Graving Dock	- - -	0	3
" Huskisson Lock and Graving Dock	- - -	1	6
" Sandon Graving Docks, Nos. 1 to 5, East	- - -	4	6
" " " " No. 6, West	- - -	4	6
" Canning Graving Docks, No. 1	- - -	9	9
" " " " No. 2	- - -	8	0
" Queens Graving Docks, No. 1	- - -	6	4
" " " " No. 2	- - -	4	6
" Brunswick Graving Docks, No. 1	- - -	5	6
" " " " No. 2	- - -	5	6
<i>Birkenhead</i> —			
Over the Sill of Morpeth Dock from Morpeth Basin	- - -	3	0
" Sills of Caisson between Egerton and Morpeth	} - 0	6	
Docks			
" Sill of Reverse Gate	- - -	2	6
" Sills of Caisson between Egerton Dock and Great	} - 0	6	
Float			
" " " " East and West Floats	- - -	0	6
" Lock from Low-water Basin into Great Float.			
	Outer Sill	+ 4	0
	Inner Sill	+ 1	0
" Graving Dock No. 1.	- - -	0	6
" " " " 2.	- - -	0	6
(applied to the heights given for Liverpool.)			
<i>Dublin</i> —			
Over the Sill of North Wall Graving Dock	- - -	+ 6	3
" Old Custom House Dock	- - -	+ 3	5
" Georges Dock	- - -	+ 5	5
" Camden Lock of Grand Canal Dock	- - -	+ 7	0
(applied to the heights given for Kingstown.)			
<i>Londonderry</i> —			
Over the Sill of Graving Dock	- - -	+ 6	9

TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or - to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

[NOTE.] In the tables from 1850-1858 the Constants for the height were given for such places only where the curves for the place and the standard port were similar, the Constant being the difference between the whole rise at the two places. But as that arrangement, which at times referred necessarily to a standard port on a distant part of the coast, appears to have confused the mariner, he is now referred to the standard port in the locality of the required place, which although the result deduced thereby may not be strictly accurate, yet it is sufficiently near for practical purposes.

COAST OF IRELAND.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundstone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
„ Strangford Quay	+ 1 21	..	"
„ Carlingford (Bar) or Cranfield Point	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
St. Ives	— 2 10	..	Weston-super-mare.
Padstow	— 1 41	..	"
Lundy Island	— 1 39	..	"
Barnstaple Bar	— 1 24	..	"
Ilfracombe	— 1 12	..	"
Bridgewater Bar	— 0 4	..	"
Portishead	+ 0 22	..	"
Bristol (King Road)	+ 0 2	..	"
Cardiff	+ 0 5	..	"
Swansea (Mumbles Lighthouse)	— 0 11	..	Pembroke.
Llanelly	+ 0 4	..	"
Tenby	— 0 12	..	"
Milford Haven (entrance)	— 0 20	..	"
Fishguard, Goodic Pier	— 3 15	— 4 5	Holyhead.
Cardigan	— 3 10	..	"
Aberystwyth	— 2 40	— 3 0	"
Aberdovey	— 2 11	..	"
Barmouth	— 2 31	..	"
Pwllheli	— 2 25	..	"
Bardsey Island	— 2 31	..	"
Porth-dyn-lleyn	— 1 41	..	"
Caernarvon	— 0 38	— 2 3	"
Beaumaris	— 0 51	— 4 7	Liverpool.
Port Fleetwood (Wyre Lighthouse)	— 0 12	..	"
Poulton-le-Sands	+ 0 3	+ 1 3	"
Whitehaven	— 0 9	— 2 9	"
St. Bees Head and Port Har- rington }	— 0 18	..	"
Workington	— 0 19	..	"
Maryport	— 0 20	..	"
Abbey Head	— 0 13	..	"
Southernness	— 0 3	..	"
Annan Foot	+ 0 33	..	"
Port Carlisle	+ 0 47	..	"
Douglas, Isle of Man	+ 1 1	..	Holyhead.
Ramsey "	+ 1 1	+ 3 3	"
Peel "	+ 0 57	+ 0 3	"
Tarn Point, Solway Firth	— 0 1	— 2 11	Liverpool.
Port Patrick	— 0 58	..	Greenock.
Loch Ryan	— 0 56	..	"
Lamlash	— 0 19	..	"
Campbellton	— 0 23	..	"
Ayr	— 0 18	— 1 0	"
Ardrossan	— 0 23	..	"
Largs	— 0 18	..	"
Inverary	— 0 2	..	"
Port Glasgow	+ 0 10	..	"
Glasgow	+ 1 17	..	"
Crinan	+ 4 41	..	"
Tobermory, Isle of Mull	— 2 52	..	Thurso.
Portree, Isle of Skye	— 1 56	..	"
Loch Inver	— 1 47	..	"
Kyle Akin	— 2 12	..	"
Tanera, Summer Isles	— 1 51	..	"
Stornoway, Isle of Lewis	— 1 42	..	"
Cape Wrath	— 0 58	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Stromness	+ 0 32	.. .	Thurso.
Lerwick	+ 2 2	.. .	"
Wick	- 2 55	.. .	Leith.
Dornock Road	- 2 17	.. .	"
Cromarty	- 2 21	.. .	"
Inverness	- 1 59	.. .	"
Banff	- 1 49	.. .	"
Peterhead	- 1 43	.. .	"
Aberdeen	- 1 17	.. .	"
Stonehaven	- 1 7	.. .	"
Montrose	- 0 52	.. .	"
Arbroath	- 0 42	.. .	"
Tay Bar	- 0 11	.. .	"
Broughty Ferry	+ 0 5	.. .	"
Dundee	- 0 50	+ 0 2	Sunderland.
Dunbar	- 1 14	0 0	"
Berwick	- 1 4	.. .	"
Holy Island	- 0 52	.. .	"
Blyth	- 0 7	.. .	"
Tynemouth Bar	- 0 2	.. .	"
Seaham	+ 0 2	.. .	"
Hartlepool	+ 0 6	+ 0 8	"
Whitby	+ 0 23	.. .	"
Scarborough	+ 0 49	+ 1 5	"
Filey Bay	+ 0 58	.. .	"
Flamborough Head	- 1 59	.. .	Hull.
Bridlington	- 1 50	.. .	"
Spurn Point	- 1 3	.. .	"
Great Grimsby	- 0 53	- 1 8	"
Lynn and Boston Deep	- 0 29	.. .	"
Wells Bar	- 0 9	.. .	"
" Harbour	+ 0 31	.. .	"
Blakeney Bar	+ 0 1	.. .	"
Yarmouth Road	- 2 51	.. .	Harwich.
Lowestoft	- 2 9	.. .	"
Orfordness	- 0 51	.. .	"
Nore	- 0 7	.. .	Sheerness.
Chatham	+ 0 25	.. .	"
Gravesend	- 0 57	.. .	London.
Woolwich	- 0 28	.. .	"
Greenwich	- 0 24	.. .	"
London Docks	- 0 10	+ 0 4	"
Margate	- 2 27	.. .	"
Ramsgate	- 2 23	- 4 1	"
Deal	+ 0 3	.. .	Dover.
Folkstone	- 0 5	.. .	"
Dungeness	- 0 27	.. .	"
Rye Bay	+ 0 8	.. .	"
Hastings	- 0 19	.. .	"
Beachy Head	+ 0 8	.. .	"
Newhaven	+ 0 39	.. .	"
Shoreham	+ 0 22	- 1 2	"
Littlehampton	- 0 5	.. .	Portsmouth.
Selsea Bill	+ 0 4	.. .	"
Bembridge Point	- 0 41	.. .	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Southampton	— 1 11	..	Portsmouth.
West Cowes	— 0 56	..	"
Hurst Camber	— 1 41	..	"
Needles Point	— 1 55	..	"
Christchurch	— 2 41	..	"
Poole	— 2 31	..	"
Portland Breakwater	— 4 40	— 5 10	"
Lyme Regis	+ 0 38	..	Devonport.
Exmouth	+ 0 38	..	"
Torbay	+ 0 17	..	"
Dartmouth	+ 0 33	..	"
Plymouth Breakwater	— 0 6	..	"
East Looe	— 0 17	..	"
Fowey	— 0 29	..	"
Falmouth	— 0 46	..	"
Penzance	— 1 13	..	"
Scilly Isles (St. Mary)	— 1 16	..	"

WESTERN COAST OF EUROPE.

Gibraltar	— 1 27	..	Brest.
Cadiz	— 2 2	..	"
Lisbon (Bar)	— 1 17	..	"
Oporto	— 1 17	..	"
Ferrol	— 0 47	..	"
Santander	— 0 17	..	"
Bayonne	— 0 2	..	"
Arcachon	+ 0 50	..	"
Tour de Cordouan	— 0 10	..	"
Bordeaux	+ 3 3	..	"
Ile d'Aix	— 0 27	..	"
Ile d'Yeu	— 0 41	..	"
Ile de Noirmoutier	— 0 45	..	"
Port Navalo	— 0 5	..	"
St. Nazaire	— 0 7	..	"
Belle Ile	— 0 29	..	"
Port Louis	— 0 36	..	"
Port Concarneau	— 0 35	..	"
Ile de Sein	— 0 26	— 1 9	"
Ouessant (Ushant)	— 0 15	— 0 1	"

NORTHERN COAST OF EUROPE.

Abervrach	+ 0 27	..	Brest.
Morlaix	+ 1 6	..	"
Plougrescan	+ 1 30	..	"
Bréhat	+ 2 4	..	"
St. Malo	+ 2 18	..	"
Granville	+ 2 26	..	"
Ile de Chausey	+ 2 22	..	"
Jersey (St. Helier)	+ 2 38	..	"
Guernsey (St. Peter Port)	+ 2 50	..	"
Ecrehous	+ 2 45	..	"

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	..	Brest.
Cherbourg	+ 4 2	..	"
Barfleur	+ 5 4	..	"
La Hougue	+ 4 55	..	"
Honfleur	+ 5 42	+ 4 3	"
Quillebœuf	+ 6 19	— 9 7	"
Havre	+ 6 4	..	"
Fécamp	+ 6 57	+ 4 2	"
Dieppe.	+ 7 19	..	"
Cayeux	+ 7 18	..	"
Boulogne	+ 0 13	..	Dover.
Cape Grisnez	+ 0 15	+ 2 4	"
Calais	+ 0 37	+ 0 10	"
Dunkerque.	+ 0 56	..	"
Nieuport	+ 1 6	..	"
Ostend.	+ 1 13	..	"
Flushing	+ 2 8	..	"
Antwerp	+ 5 13	..	"
Hellevoetsluis	+ 3 18	..	"
Rotterdam.	+ 4 33	..	"
Helgoland	— 0 33	— 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard ; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour ; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N.W. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North, till at the last 4½ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At 3¼ hours ebb on the shore it sets W.S.W. ; at 4 hours W. by N. ; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E. ; and then E.N.E and E. by N. till about high water, when its direction is E. by S.

From Bolt Tail to Start Point, at 4 miles off shore, the eastern stream makes at 3 hours after high water, and the western stream 3 hours after low water on the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is irregular, varying from 4 to 7 hours after high and low water on the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off the Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about $4\frac{3}{4}$ hours. The direction of the western stream for the first 2 hours is W.S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is E.N.E.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 10h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, or until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

In West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{1}{2}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{1}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour N.N.E. to E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of the flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S.S.E., 2 knots.

At $2\frac{1}{4}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{4}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E.N.E. $\frac{3}{4}$ E., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{3}{4}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W.S.W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W.S.W. $\frac{3}{4}$ W., $1\frac{3}{4}$ knots. N.B.—About a mile south of the Bill, at half flood, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots. 2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. The 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, about west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 4h. 45m.: the flood and ebb are of equal duration, the former setting S.E., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern or flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{3}{4}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{3}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{3}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W.S.W. $\frac{1}{2}$ W. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part, W. $\frac{3}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{4}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high waters occur on either shore of the Solent, as shown in the times of high water at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour, with a rise and fall of 3 or 4 inches for another hour, and only rises and falls 13 inches for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the docks on the same tide.

somewhere near the Light Vessel; for instance, at the 1st hour's flood by the shore it sets East; 2d and 3d hours, E.N.E.; 4th, N.E.; 5th, N.E. by N.; 6th, North; 7th, N.N.W. to N.W.; and the last drain of the flood, N.W. by W. The 1st hour's ebb sets W. by N.; 2d W. by S. to W.S.W.; 3d, S.W. by W. to S.W.; 4th, S.W. $\frac{1}{2}$ S., the first part of the 5th hour, S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2 o'clock, and runs $7\frac{1}{2}$ hours about S.S.E.; and the western stream at 9h. 30m., and runs nearly $4\frac{1}{2}$ hours N.N.W.

Near the Horse Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2 o'clock, $2\frac{1}{2}$ hours after the tide on the shore, and runs to the S.E. $7\frac{1}{4}$ hours; the western stream makes at 9h. 15m., $4\frac{3}{4}$ hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2 o'clock, runs to the S.E. for 2 hours, and then sets east for the remainder of the tide, $5\frac{1}{2}$ hours; the western stream makes at 9h. 45m., and runs W.N.W. $4\frac{1}{4}$ hours.

At Spithead, at full and change, the eastern stream makes about 2 o'clock, $2\frac{1}{2}$ hours after high water in the harbour, and runs 7 hours S.E. by S.; and the western stream about 9 o'clock, $2\frac{1}{2}$ hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about seven hours, and a narrow stream runs in, fifteen or twenty minutes after high water at the Dock-Yard. From the result of three years' observations taken at the Dock-Yard it appears that at high water, slack water at springs continues for eight minutes, and at neaps sixteen minutes.

Looe Stream. At the western entrance near the Pullar Buoy, at full and change, the eastern stream makes at 3h. 45m., and the western stream at 10 hours, and sets S.E. and N.W. Between 2 and 3 miles outside of the Boulder Bank, the stream turns about an hour later; the eastern stream setting E.S.E. and the western stream west. Between the Pullar Bank and the Middle Owers, the eastern stream sets E.S.E. and the western stream west. At the eastern entrance, near Eastborough Head, the eastern stream makes at 4h. 30m., and sets E.N.E. $\frac{1}{2}$ E., and the western stream at 9h. 50m. west. Off the west end of the Hooe Bank, the eastern stream makes at 4h. 35m. and sets E.S.E., and the western stream at 10h. 30m. W. $\frac{3}{4}$ N.

About 1 mile S.S.E. of the South Foreland Lighthouse, the stream begins to set to the eastward about 1h. 30m. before high water on the shore at Dover, and runs from N.E. by E. to E.N.E. about $5\frac{1}{2}$ hours, or till 4 hours after high water: it then turns and sets W.S.W. $\frac{1}{4}$ W. about 7 hours. At Dover the flowing stream very seldom continues more than 5 hours, and sometimes scarcely so much; it is nearly the same at Ramsgate. To the northward of the South Foreland the streams change their direction to N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S.

In the Downs the north-eastern stream begins about 1h. 20m. before high water at Dover, and continues to run 5h. 30m.: it then turns and runs in a contrary direction till 2 hours before the ensuing high water.*

In the Gull Stream, 1 mile N.N.W. from the Bunthead, the northern stream begins about 1h. 10m. before high water at Dover, and continues for 6 hours: it then turns and runs in a contrary direction till $1\frac{1}{2}$ hours before the ensuing high water. Its direction is N.E. $\frac{3}{4}$ N.; but the last hour changes to E.N.E., and even to the southward of East; the last hour of the southern stream changes from S.W. $\frac{3}{4}$ S. to W.S.W., and even to the northward of West.

* For the tides at the Southsand Head and Northsand Head of the Goodwin, see Compartment VI.

TIDES ON THE EAST COAST OF SCOTLAND AND ENGLAND.

In the North Sea the flood tide-wave enters from the Atlantic Ocean between the coast of Norway and the British Isles, and passes through the various channels formed by the Shetlands, the Orkneys, and the north point of Scotland. The average rate of the stream in the offing is very moderate, not exceeding a knot and a half; but that part of the stream which enters by the Pentland Firth acquires a furious rapidity, amounting at spring tides even to eight knots. Immediately on quitting the Firth, however, it abates in strength, as it diverges into open water; its eastern branch filling up the basin of the North Sea as it advances towards the coast of Jutland and Holland; whilst its western branch, more or less confined by the Dogger and other outlying banks, swells along the shores of Scotland and England, and makes high water in all their rivers and harbours successively till it arrives in the Thames.

The following remarks will assist the seaman in tracing the movement of the tide stream along the coast :—

Off Clythness and Ord Head its rate is about 3 knots at the springs and $1\frac{1}{2}$ with the neaps, and continues to run to the southward till 11 o'clock, or till 3h. 40m. before high water at Leith. Off Covesea Point, Burgh Head, and thence westward towards Fort George and Cromarty, it runs about an hour longer.

Off Cullen the flood stream sets slowly to the eastward, increasing in velocity as it advances: off Troop Head it runs till 1 o'clock, or till 1h. 20m. before high water at Leith; off Kinnaird Head it attains the rate of 2 knots on springs, and is still accelerated as it passes Rattray Brigs till off Peterhead, which is occasioned by the junction of the direct stream from Duncansby Head. Six miles off Kinnaird Head the stream runs to the southward till 2, and at 12 miles till 3 o'clock, or till 40 minutes after high water at Leith.

Off Buchanness the stream attains its greatest strength, namely 4 knots on the springs, and $2\frac{1}{2}$ on the neaps; but off Newburgh it decreases to less than 2 knots, and ceases at 2 o'clock; and at 4 or 5 leagues in the offing it runs till 3 o'clock, or 40 minutes after high water at Leith.

The stream runs past Girdleness till 2h. 30m., or 10m. after high water at Leith; springs at the rate of $2\frac{1}{2}$, neaps $1\frac{1}{2}$ knots. It runs across the mouth of Montrose Harbour and past Red Head till 3 o'clock, or 40 minutes after high water at Leith. From Red Head it sets into St. Andrews Bay till the last quarter, which sets S. and S.S.E.; but to the westward of Red Head it sets W.S.W. past Arbroath and over the Tay Bar.

At 2 miles without the Bell Rock Lighthouse the flood continues running to the southward till 2h. 55m. after high water at Leith; but between the Bell Rock and Fifeness it changes 2 hours earlier. The first part of the latter stream sets towards May Island, the middle to the South, and the last part S.S.E. The first part of the ebb sets from E.N.E. to N.E., the middle N.N.E., and the last part more northerly.

About a mile off St. Abbs Head the flood stream runs to the south-eastward till 2h. 55m. after high water at Leith; but at $5\frac{1}{2}$ or 6 leagues in the offing it continues a quarter of an hour later. About 3 miles off Berwick it runs till 4h. 10m. after high water at Leith.

At 5 miles off North Sunderland Point, and at the same distance south-eastward of the Staples, the flood stream continues till 3h. 25m. after high water at Leith.

About 2 miles off Blyth Harbour, and 4 miles off Tynemouth, it runs to the southward till 3h. 40m. after high water at Leith; and at 4 miles off Sunderland, a quarter of an hour later.

At 3 or 4 miles off Hartlepool, and at the same distance off Whitby the flood stream runs to the southward till 4h. 10m. after high water at Leith; and at the same distance off Flamborough Head it continues to run half an hour longer.

Near the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 9 o'clock, or three hours after high water on the shore.

Four miles off Cromer, and the same distance off Hasborough, the flood stream runs along shore to the southward till 10h. 15m., or 1h. 45m. before high water at Harwich, and the ebb in a contrary direction.

At 2½ miles off Lowestoft the flood stream continues to run to the S.S.W. till 1h. 30m. before high water at Harwich.

At Orfordness the flood stream continues to run till about high water in Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

At Margate it is high water about 11h. 40m. by the ground. Near the East buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 9h. 15m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, and increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished velocity, till at low water it falls slack at south.

In the River Medway the flood stream runs up in mid-channel from twenty to twenty-five minutes after high water at Sheerness Dock-Yard; but at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the Thames for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the times and the heights of high water. Thus in the North Sea a strong N.N.W. gale and a low barometer raise the surface 2 or 3 feet higher, and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times and heights predicted in the Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Portland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, to the southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed further south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY CAPTAIN F. W. L. THOMAS, R.N.

THE great rapidity of the tidal streams among the Orkneys makes a correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

In the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick smoke; upon the open coast the sea rises at once, and striking upon the rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsá.

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these ripplings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time; the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentland Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick gives 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appeared that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fail while the flood is running, there would be a great probability of drifting ashore.

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

*Depth of the
Tidal Stream.*

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

*Difference of
Sea-level.*

*Mean range at
North Isles.*

*Semidiurnal
inequality.*

South Isles.

*Set of tide,
Mull of Papa.*

*from Mull of
Papa to North
Ronaldsha.*

stream off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa and North Ronaldsha 3 knots; but near North Ronaldsha the rate again increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one with a small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry,
Röst.
North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the flood having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2.8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long oval, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed upon a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood tide; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Trevan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely bad *röst* off the Start with southerly winds and flood tide; it stretching 3 or 4 miles to sea, but being heaviest near the shore.

Start of Sanda.

Röst.

Between Westra and Sanda the stream is scarcely sensible, but gathering strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Stronsa Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before it is low water on the shore, or $1\frac{3}{4}$ hours before it is low water in the stream, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

* *Röst* (pronounced reust) a Scandinavian word, meaning a roaring, broken, tidal sea.

the narrows when passing Spur Ness, but it speedily becomes diffused in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.

*Stronsa and
Westra Firths.*

In the Stronsa and Westra Firths, which form one continuous and nearly straight channel, the tide stream is very rapid, as through them and Enhallow Sound the body of the ocean tide is discharged.

North Shoal.

At the North Shoal, which is 15 miles from the entrance of the Firth, the tide sets W. by S. (towards the entrance), and at springs scarcely runs 2 miles an hour; neaps about one.

*Brough of
Birsu.*

Along the coast of West Mainland, or Pomona, the stream is only sensible off the points; but off the Brough of Birsu the flood stream sets to the northward for two hours after it is high water on the shore. when its greatest rate is 2 knots.

*West coast of
Rowsa.*

From the Brough of Birsu the flood sets along shore for Costa and Sacquoy Heads, increasing in velocity as it approaches the Westra Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of Quendale.

Skea Skerries.

The flood stream runs South along the West coast of Westra, from the Noup to the point of Skea, and over the Skea Skerries. Between them and Rowsa the stream acquires great force, even 6 knots, and does not turn for two hours after high water on the shore. Its chief weight passes close round Kili Holm, and crosses for War Ness, (the South Point of Eda,) and the Greenholms.

*Kili Holm.
War Ness.*

Stronsa Firth.

At War Ness the tide stream runs 7 knots, and the röst is quite impassable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in violent commotion, and when bound to Stronsa, a line of breakers may sometimes be seen roaring and foaming within half a cable's length, while vainly looking for a gap or smooth.

The main stream from War Ness, joined by the Stream from Eda Sound, sets past Rousholm Head, and clear of Auskerry to the open sea; and from the Greenholms, past Shapinsha and Deerness, where it is joined by the String, the usual name for the direct run of the stream from Eynhallow Sound by Gairsa, Eiler Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Deerness and Auskerry about 4 knots.

*Weatherness
and Fara Ness
Sounds.*

The tides in Weatherness and Fara Ness Sounds are peculiar; the stream turns to the eastward as soon as the tide has ceased to fall upon the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it does in Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets very weakly towards Calf Sound.

*Egilsha and
Shapinsha.*

A very weak stream runs south through Howan Sound during the flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.

Sound.

The flood stream from Costa Head and the reef of Quendale runs towards Eynhallow, and divides there, passing Burgher and the Wael Race at the rate of 7 knots; the streams unite when past the island, but do not average more than 4 knots down Eynhallow Sound.

*Wyre Sound.
Swine Holm.*

A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the latter stream unites with that from the Westra Firth, the rate scarcely equals 2 knots. In the narrow channels among the group of Holms between Gairsa and Shapinsha, the flood sets southerly 6 knots.

*Between Gairsa
and Shapinsha*

*and by Work
Head.*

The main stream from Eynhallow Sound passes S. of Gairsa and thence transversely to Stromberry Head, and on through Shapinsha Sound. The tide stream is narrow in its passage between Work Head and Eller Holm, nor does the *String* expand for some distance after

passing that place; the rate at springs is about 3 knots, and the stream does not turn till $1\frac{1}{2}$ hours after high water on the shore.

The flood-stream running through Hoy Sound commences on the North Side at the Millstone Quarry, 4 miles from Hoy Mouth, and on the South from Hoy Head; the indraught is scarcely felt 5 miles outside the entrance. *Hoy Sound.*

In Hoy Mouth the rate of the stream is 4 knots, until it divides upon Gremsa, when the rate increases to 6 knots; one stream passing through Burwick Sound, the other between Gremsa and Stromness. *Burwick Sound.*

The tide goes over the Skerry Ness, and from thence sets fair for the Skerries of Clestron, where it divides, one stream running up and filling the Bay of Irland, and at half flood setting as a back-tide out of Cairston Road; the other setting rather off shore at first, and then towards Houton Head. From Burwick Sound the stream sets along the shore of Hoy to Green Head, the rate being scarcely 3 knots; and Gremsa causes a large arrear of slack water in the middle of the Sound. *Houton Head.*

After passing Houton Head, the flood stream becomes diffused in Scapa Flow, and is only sensible off that point; its general direction is towards Holm Sound, and at the Barrel of Butter it scarcely runs 2 knots at springs. On the West side of Holm the stream drains along shore to Halcrow Head, where it meets the stream from the Pentland Firth. *Scapa Flow.*

The tide stream runs with greater velocity and turbulence through the Pentland Firth than in any other part of the Orkneys; so that with a strong gale and a weather spring-tide the sea is in many places impassable, and after the wind has gone down, the sea continues to break with great violence for some days, indeed in a sailing ship more danger is to be apprehended from a calm than from a gale of wind. The tide wave from the Atlantic, opposed by the West coast of the Orkneys, is pressed against the shores of Caithness, where at Thurso the tide rises nearly 5 feet higher than at Stromness, though the latter is but 20 miles to the northward. This accumulated mass of water finds egress through the Pentland Firth, where the velocity of the stream near the Little Skerry was said by Captain Otter to have acquired the rate of 10 knots. At the Great and Lothar Skerries, which resist a large body of the tidal stream, the water is sensibly higher by 1 or 2 feet upon the stream side, and a small rapid is formed, of little height indeed, but of great power. Vessels that have drifted upon this rock, when covered by the tide, have been rolled over it, and sunk in deep water on the other side. *Pentland Firth.*

The establishments of the following places in the Pentland Firth were determined by Captain Otter:—

Establishments.

PLACES.	High Water.	Rise above the Spring L.W.	Range, or Rise between L.W. and H.W.			REMARKS.
		Spring.	Neap.	At Springs.	At Neaps.	
	h. m.	ft. in.	ft. in.	ft. in.	ft. in.	
Thurso, Scrabster Road.	8 28	14 10	11 0	14 10	5 6	Deduced from 4 years observations.
Duncansby Ness	10 14	10 0	8 6	10 0	4 0	Mean of 19 comparisons, but very irregular.
Stroma, South Side	9 47	9 0	7 6	9 0	4 0	Mean of 12 comparisons with Thurso.
Swona, East Side	10 24	- -	- -	- -	- -	
West Side	9 35	- -	- -	- -	- -	
Pentland Head, Great Skerry, East Side	11 4	9 3	8 0	9 3	3 0	Mean of 33 comparisons with Thurso.
Great Skerry, West Side	10 53	- -	- -	- -	- -	
Widewall	9 3	- -	- -	- -	- -	Mean of 7 comparisons with Thurso.

The directions as well as the velocities of the tidal streams in the Pentland Firth vary with the hour of the tide; and in almost every case the flood takes a more southerly direction as the tide grows older, and the contrary with the ebb.

Rate.

Direction.

The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching the entrance. Between Turn Ness and Dunnet Head the usual springs rate is 7 knots, but as they round the South end of Swona and North end of Stroma, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore, the flood stream makes strong along the coast of South Walls, and curving to the northward of Swona, washes the Great Lothar, and passes to the northward of the Pentland Skerries.

At a later period of the tide, the stream from Brims Ness goes direct to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she will pass a mile to the southward of Swona, and the same distance to the southward of the Skerries.

Hoxa Sound.

From Cantick Head the flood stream sets past Stangar Head, and crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other runs about 4 knots towards Water and Holm Sounds.

Holm Sound.

Through Holm Sound the rate of the stream is 6 knots where strongest, and it turns at one hour after it is high water on the shore. The rate through Water Sound is 4 knots.

Water Sound.

Cantick Sound.

*East side of
Hoy.*

From Cantick Head a weak stream runs northwards, filling Long Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest part of these Sounds is 2 knots.

*Pentland Firth;
round Swona ;*

Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Swona; but it is almost impossible to predict exactly what direction a drifting vessel would take; with Barth Head open North of Swona, the first quarter flood would send her to the northward of that island, and through the mid-channel between it and South Ronaldsha; but the half flood would probably press her too close to Barth Head, and perhaps on the Great Lothar.

from Widewall.

The first of the flood stream from Widewall sets direct on Barth Head and the Lothar, so that in light winds vessels should in all cases pass as near to the North Head of Swona as possible. As a general rule, if a ship, having left Widewall with light winds and flood tide, should drift nearer to Swona than Barth Head, she will be likely to clear the Lothar—if nearer to Barth Head, she will go too close to that rock.

*Pentland
Skerries.*

When the flood stream first makes at the north head of Swona, it first sets across the channel, but presently turns to the southward, passing clear of the Lothar, and then to the northward of the Pentland Skerries; but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide, sets towards them.

Between the Lothar and the Skerries the flood stream sets fair out to sea, about E.S.E., joining the main stream from Stronsa Firth.

From the South end of Swona the first flood sets right on the Great Skerry, dividing there, and running 7 knots close to the North rocks. On the South side the stream sets off (leaving a narrow eddy inside), at first towards the Little Skerry, but it gradually curves and goes clear of

the Clette. A vessel, however, must be very near the Great Skerry to drift in that direction; if only half way between the Great and Little Skerries she would infallibly drive upon the rocks, where the current runs like a mill-stream. It must be observed, that the general tendency of the flood-stream is to set clear to the westward of the Skerries, and that a vessel must be very near the opening between the Great and Little Skerries before she would feel its indraught. After half tide in the stream, the set of flood from Swona goes well clear to the southward of the Pentland Skerries.

I cannot state with the same personal confidence the direction of the streams of tide on the South side of the Pentland Firth, but the experiments of Capt. Otter show that the flood stream from Dunnet Head and St. Johns Point has a tendency to pass to the northward of Stroma, so that a buoy set adrift within half a mile of Mey Bay will not float through Inner Sound, but rather drift on shore on the west side of Stroma; and from this it would appear that a vessel one mile to the northward of Dunnet Head, with strong flood, will go well clear to the northward of Swona.

Inner Sound.

The last of the flood stream is pressed down upon Duncansby Head, where it does not cease running till 4 hours ebb on the shore; for which reason, when a vessel is turning up from the southward, she should rather endeavour to enter the Firth upon the North side, when she will usually be able to get as far as Brough Ness while the flood is still running.

Duncansby Head.

There are large eddies under Stroma and Swona with the flood, and where they meet the main stream little whirlpools are produced, which credulity has exaggerated into objects of importance; on rare occasions they might be dangerous to boats.

Eddies of Swona and Stroma.

It is almost still water to the eastward of the Skerries during flood, and a large eddy is formed between the Great Lothar and Old Head, commencing at half-flood on the shore; it is called Liddel Eddy, from a farm of that name in South Ronaldsha.

Eddies of Pentland Skerries; and Liddel Eddy.

Wherever the tide stream is rapid past any point there is always an eddy on the opposite side, and these eddies increase as the tide grows older, till at last only a narrow stream of the former tide is left; this may be well witnessed in Hoy Sound, where the flood stream is sometimes diminished by the encroaching ebb to 20 and 30 feet in breadth.

The indraught of the ebb stream to the Pentland Firth is felt at a considerable distance from the entrance, so that vessels leaving the Mull of Deerness in calm weather are sometimes drifted into the Pentland Firth. From Copinsha the stream runs nine hours to the southward, from half flood on the shore to low water; but its rate is slow, never exceeding 2 knots, except near Old Head, where it runs four.

Ebb stream,

There is not much danger to be apprehended from the ebb stream, in the Pentland Firth when it has made strong; about 3 hours after low water on the shore, it sets fairly through between Duncansby Head and the Skerries, between Swona and Stroma, and over towards Hoy; and a vessel must be far within a line joining Duncansby Head and the North end of Stroma, to feel the indraught of the Inner Sound; for a buoy that has drifted through that Sound with the flood stream will not return with the ebb.

in the Firth.

Inner Sound.

Round Brough Ness the ebb pours with great violence, and over the tail of the Great Lothar, where several vessels have thereby been lost.

Great Lothar.

The stream from the North side of the Pentland Skerry sets upon Swona, dividing upon the South Clette; but the last part of the ebb will go to the northward, between Barth Head and Swona.

Swona.

From the North Head of Swona the first ebb goes towards Brims Ness, the last towards Switha. There is a very large eddy under Swona

Eddy.

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and incloses a large eddy; at half tide these united streams set over toward Turn Ness, where the last of the ebb tide drains, while there is comparatively still water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of the several streams, can learn from the chart.

REMARKS ON THE SET OF THE TIDAL STREAMS IN THE IRISH AND ENGLISH CHANNELS, AND IN THE NORTH SEA.—BY REAR-ADMIRAL F. W. BEECHY, F.R.S.

*The Common
Standard for
the turn of the
Streams*

A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water along the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover; and to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.); and it is only necessary to mention here, that to the southward of the parallel of Scilly, the tides of the Channel and offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to make the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of their course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolving motion of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, yet directly she is loose she will be carried away upon a rhomb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is more regular, and while the water is *falling* at Dover, will be found setting to the *northward*: near the coast partaking of the direction of the shore, and turning sharply round Trevoise Head and Hartland Point into the Bristol

Channel; and while the water is *rising* at Dover, setting as sharply out of the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; and at Trevoise Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; at present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about the parallel of $51^{\circ}00'$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versa*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is falling at Liverpool, and *vice versa*. To the westward of this line the tides appear to be slack; but we are in want of further observations in all this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west round Cape Clear, and *vice versa*.

Seven Stones.

Meeting of the
Stream in
 $51^{\circ} N.$

Streams between
Scilly and
Tuskar.

Off S. coast of
Ireland.

At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, and N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versa*, as before stated. The entrance of Liverpool is properly the standard to which the turn of the stream in these pages is referred, and wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges Pier, to which the tide tables are adapted.

Off the Smalls.

On the Irish side, at the Saltees Lightship, for instance, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{4}$ hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. for the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

Off the Saltees.

From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore
Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE WHEN AT THEIR GREATEST STRENGTH.

Streams turn with the tides of Liverpool and Morecambe Bay.

IN the Irish Channel, as before observed, experiments have shown that, notwithstanding the variety of times of high water throughout the Channel, the turn of the stream over all that part which may be called the fair navigable portion of the Channel is nearly simultaneous; that the northern and southern streams in both Channels commence and end in all parts (practically speaking) at nearly the same time; and that that time happens to correspond nearly with the time of high and low water on the shore at *the entrance* of Liverpool and of Morecambe Bay,* a spot remarkable as being the point where the opposite tides coming round the extremities of Ireland terminate. So that it is necessary only to know the times of high and low water at either of these places, to determine the hour when the stream of either *tide will commence or terminate in any part of the Channel*. For this purpose the Liverpool tide-table may be used, subtracting 18 minutes from the times there given, in consequence of the high water at St. Georges Pier being later than the point which is considered as the head of the tide, and which will be found fully explained at page 125.

Streams enter N. and S. of Ireland.

The tide from the Atlantic enters the Irish Channel by two channels; of which Carnsore Point, the S.E. point of Ireland, and St. Davids Head, the S.W. point of Wales, are the limits of the southern one; and Rathlin and the Mull of Cantyre the boundaries of the northern.

Southern streams from Tuskar to the Isle of Man.

The *central portion of the stream* of flood or *ingoing* stream, runs nearly in a line from a point midway between the Tuskar and the Bishops, to a position 16 miles due west of Holyhead; beyond which it begins to expand eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes to the eastward with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it is arrested by the flood or southern stream from the North Channel coming round the Point of Ayr, and is first turned round to the eastward by it, and then goes on with it at an easy rate direct for Morecambe Bay; thus changing its direction nearly eight points.

Eastern Branch of S. stream sets into Cardigan Bay.

The *outer portions* of the stream are necessarily deflected from the course of the great body of the water by the impediments of banks on the Irish side of the Channel, and by the tortuous form of the coast on the Welsh. The eastern portion passing Linney Head, rushes with great rapidity between the Smalls, Grassholm, and Milford Haven towards the Bishops, which it passes at a rate of between 4 and 5 knots; sets sharply round those rocks in an E.N.E. direction right over the Bass Bank, and into Cardigan Bay; makes the circuit of that Bay, and sets out again towards Bardsey, at the other extremity of it; then sweeping to the N. by W. past the island and through the Sound, it gradually takes the course of the shore, round Caernarvon Bay, filling the Menai Strait as far as Bangor; but the stream still continuing outside towards the South Stack, which it rounds, setting towards the Skerries at a rate of upwards of 4 knots; and, finally, turns sharp round those rocks for

* The entrances of Liverpool and of Morecambe Bay are, as before stated, 18 minutes earlier in their times of high water, than those given for Liverpool in the tide-tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the ebb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

Western Branch sets over the Irish banks.

Off Arklow, no rise or fall.

Codling Bank.

Stream ends off Carlingford. No stream there.

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 20 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

Northern Stream from Rathlin to the Clyde.

The *central portion* midway between the Mull of Galloway and the Copeland Island presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

Central portion of this stream sets to Isle of Man and Morecambe Bay.

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

Western branch of N. stream to Maidens and Belfast.

dangerous group ; and takes the direction of the coast again from Muck Island to Black Head, at the entrance of the Lough of Belfast, which it fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough splits off Grey Point ; one portion flowing up towards Garmoyle, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. Johns Point ; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed, although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams. These observations do not, however, extend beyond the points where the Channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left ; that on the north joining the stream from Jura, and turning sharp round Rathlin ; that on the south, speaking now of the outgoing stream, sweeps past St. Davids Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

TABLE SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.

In the following Table, the direction of the stream as it runs at the middle of the tide or at its greatest strength, is given at four places upon lines connecting well known headlands, viz., at 5 miles from the shore, on each side of the channel, and at a third of the distance across the channel from each of those headlands. The names of the places will be found in the marginal columns; and in the adjacent column, a brief description of the course of the streams in the immediate vicinity of each headland. The western part of the stream will be found on the left-hand page, and the eastern half on the right-hand page. *Explanation.*

To use the table, take the line nearest to your position, and at the distance across the Channel which answers best to your distance from the land, take out the direction of the stream from its column; or if the place of the ship falls between two divisions, take the mean of the two directions given in the columns for the direction of the stream at that time. To know when the stream will turn, look in the Tide Tables for the time of high water at Liverpool, for the day, and about 15 minutes after that time the stream will begin to *set out* in both the North and the South Channels, and will run in that direction until about 45 minutes before low water, when the general slack water begins. The slack water in the offing is usually spread over an interval of an hour—from the cessation of one stream to the beginning of the next.

In these tables { F stands for *flood* or *rising* tide at Liverpool.
E stands for *ebb* or *falling* tide at Liverpool.

As a rough general rule, in the fair way of the Channel a vessel will be carried 9 miles by the stream in a whole tide at springs, and at neaps about 6 miles; but near to the land on either side, or to the banks, the rate of the stream greatly increases.

The rates given in the table which follows are at spring tides; and in order to adapt them to neaps, one third may be subtracted from them.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	1/2 over.		
On a line joining the Tuskar and St. Davids Head.	The stream curves with the land and slacks in shore 1 1/2 hours before the offing, and inside the Long Bank 2 1/2 hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. 3/4 E. S.W. 1/4 W.	Rate. 3 3	N. E. by E. 1/4 E. S. W. by W. 1/4 W.	Rate. 2 1/2 2 1/2 F E
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. 1/2 N. S.W. by S.	3.6 3.6	N.E. 1/2 N. S.W. 1/4 S.	3 1/2 3 1/2 F E
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns 1 1/2 hours before the offing, and 2 hours close in shore.	Kish Light Shp.	N.N.E. S.S.W. 1/4 W.	2.0 2	N.N.E. S.S.W. 1/4 W.	2 1/2 2 1/2 F E

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs 2 1/2 knots at springs.
At 5 miles ditto ditto 3 to 3 1/2 knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. 1/2 E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. 1/2 N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	1/2 over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. 1/4 S. W.N.W. 1/2 W.	Rate. 2 1/2 2 1/2	E. 1/4 N. W. 1/4 S.	Rate. 1 1/2 1 1/2 F E
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. by E. S. by W.	1.0 1 1/4	N.E. 1/4 E. S.S.W.	1/2 1/2 F E

of the TIDAL STREAMS in the IRISH CHANNEL.

of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F	N.E. $\frac{1}{2}$	Rate. $2\frac{1}{2}$	N.E. $\frac{3}{4}$ E.	Rate. $3\frac{1}{2}$ to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardi- gan Bay, sweeping more consequently an in-draught	On a line join- ing St. Davids Head and the Tuskar.
E	S.W. $\frac{1}{2}$ W.	$2\frac{1}{2}$	S.W. $\frac{3}{4}$ W.	4			
and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.							
F	N.E. by N.	$3\frac{1}{2}$	N.N.E. $\frac{1}{2}$ E.	3	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1h. 20m. in the Bardsey	On a line join- ing Bardsey Island and the Arklow Light Ship.
E	S.W. $\frac{3}{4}$ S.	3	S.S.W. $\frac{1}{2}$ W.	$2\frac{1}{2}$			
Sound before it does in the offing; the flood setting strong into Caernar- von, and the ebb strong into Cardigan Bay, and <i>vice versa</i> .							
F	N.N.E. $\frac{3}{4}$ E.	$2\frac{1}{2}$	N. by E. $\frac{1}{2}$ E.	$3\frac{1}{2}$	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and	On a line join- ing Holyhead and Kish Light Ship.
E	S.W.	$2\frac{1}{2}$	S.W. $\frac{1}{2}$ S.	3			
more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.							

first quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N. W. and W. S. W. from the lighthouse, according to time of tide; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N. W. winds occasion the heaviest seas; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N. E. by E. $\frac{1}{2}$ E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F	East	Rate. 2	E. $\frac{1}{2}$ N.	Rate. 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on	On a line joining the Skerries and the Calf of Man.
E	W. by S.	$1\frac{1}{2}$	W. $\frac{3}{4}$ S.	3			
thence to Lynus and Liverpool in nearly a direct line ; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay ; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head ; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.							
F	E. $\frac{3}{4}$ N.	$1\frac{1}{2}$	S.E. by E.	2	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the	On a line joining the Calf of Man and Rockabill.
E	W. by S.	$1\frac{1}{2}$	N.N.W. $\frac{1}{4}$ W.	$1\frac{1}{2}$			
ebb to the northward ; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.							

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		‡ over.		
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. ¼ N. W. ¼ N.	Rate. 3½ 3½	East West	Rate. 2 2	F E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs 2 knots at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of 3½ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	S.W. by W. ¼ W. N.E. by E.	1½ 1½	S.W. ¼ W. N.E. ¼ N.	0½ Drain	F E
On a line joining Peel and Mull of Gallo-way.	- - -	Peel -	E. ¼ N. W. ¼ N.	1 1½	E. by S. W.N.W. ¼ W.	1½ 1½	F E

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		‡ over.		
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	S.E. by E. ¾ E. W. by N.	Rate. 3½ 3	E. ¾ S. W. by N.	Rate. 2½ 3½	F E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. ¾ E. N.N.W.	2½ 1½	S. ¾ E. N.W. by N.	2½ 2	F

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. ¼ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		‡ over.		
On a line joining Copeland Island and Mull of Gal-loway.	- - -	Copeland Island.	S. ¼ E. N. ¼ W.	Rate. 2 2	S. by E. ¼ E. N. by W. ¼ W.	Rate. 2 2½	F E

Magnetic Direction and Rate of the

After High Water at Liverpool.											
1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. ¼ E.		North		N. by W. ¼ W.		N.N.W. ¾ W.		N.W. ¼ N.		S.W. ¼ W.	

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

of the Stream.				Remarks on the Tides near the Land.		Position.
1 over.		5 Miles.	From			
F S.E. by E. $\frac{1}{4}$ E. E W.N.W.	Rate. $1\frac{1}{2}$	S.E. $\frac{1}{4}$ S. N.W. $\frac{1}{4}$ W.	Rate. 2 2	Walney Island.	The stream sets sharply round Walney Island into Morecambe Bay.	On a line joining Walney Island and the Calf of Man.
F S. $\frac{1}{4}$ E. E Slack	$0\frac{1}{2}$	S. $\frac{1}{4}$ W. N. $\frac{3}{4}$ W.	$1\frac{1}{4}$ $1\frac{1}{4}$	Peel	To the N.W. of Peel the stream divides; one part runs towards the Calf,	On a line joining Peel and St. Johns Point.
the other turns to the N.E., passes Contrary Head, so called from the set of the tides off it, and runs with an increasing rate along the land to Jurby, and thence to the Point of Ayr.						
F E.S.E. $\frac{1}{4}$ E. S.W. by W. $\frac{3}{4}$ W.	$2\frac{1}{2}$ $2\frac{1}{2}$	E.S.E. $\frac{1}{4}$ E. N.W. by W.	$3\cdot0$ $3\frac{1}{4}$	Mull of Galloway.	Off the Mull of Galloway the stream attains its greatest strength, and occasions a race off the head; but there is usually a slack very close	On a line joining Mull of Galloway and Peel (Isle of Man).
to the shore, of which steamers who are acquainted take advantage. Between the Mull and Burrow Head the stream bends to the northward, and finally takes the curve of the bay of Luce, setting sharply into the bay round the Mull, and out round Burrow Head.						

of the Stream.			Remarks on the Tides near the Land.	Position.
5 Miles.	From			
F East E W.N.W. 1/4 W.	Rate. 4 4	Burrow Head	- - - - -	On a line joining Burrow Head and Point of Ayr.
F S.E. by S. E N.W. 1/4 N.	1 1/2	St. Bees Head	Between King William Bank and St. Bees Head the stream is slack, but near St. Bees begins to run, one part passing up the Solway, the other going on towards Walney.	On a line joining St. Bees Head and Point of Ayr.

passes on to Maughold Head, where it meets with the tide from the southern channel. At half flood the stream at the Bahama runs towards Ramsay, and then turns to the north-west the rest of the tide.* A few miles westward of this spot, in latitude 54° 18' N. and longitude 4° W., the streams from the Calf of Man, and that which had passed over the Whitestone Bank, meet and thence run directly for Walney Island.

of the Stream.			Remarks on the Tides near the Land.	Position.
5 Miles.	From			
F S.S.E. 1/4 E. E N. by W. 1/4 W.	Rate. 3 3	Mull of Galloway.	- - - - -	On a line joining Mull of Galloway and Cope-land Island.

from at the Bahama Light Vessel.

Before High Water at Liverpool.									
4 Hours.		3 Hours.		2 Hours.		1 Hour.			
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
S. 1/4 W.		S. 1/4 W.		S.W.		N.W. 1/4 W.		N. by E. 1/4 E.	

* See Bahama Light Vessel.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Copeland Islands and Lough of Belfast.

The main body of the stream, ebb and flood, crosses the entrance of this Lough in a curve from the Copeland Islands to Blackhead, and near the islands gains a strength of 5 knots; this curve bends more and more in until it stretches from Whitehead to Grey Point, when it divides, one part of the flood running up to Garmoyle, the other bending back and running towards Orlock, and near that place will carry a vessel upon the Briggs if not guarded against.

The first of the flood sets through the Copeland Sound and between the islands at a rapid rate, and care must be taken not to be swept into the intricate passage between the Copeland Islands. At half tide all the inshore part of the tide within $1\frac{1}{2}$ miles of the coast south of the Copelands slacks, and shortly turns to the northward and runs for 3 hours, whilst the stream in the offing is still going to the southward; so that from Ballyferris Point to Foreland Point, quite close in, the stream runs 9 hours to the northward and only 3 to the southward.

Position.	Remarks on the Tides near the Land.	Magnetic Direction			
		From	5 Miles.	$\frac{1}{2}$ over.	
On a line joining Corsewall Point and Sanda Sound.	Near Corsewall the stream gains strength, and close in takes the curve of the land, the flood setting to the S.W. round the lighthouse, and the ebb reversed.	Corsewall Point.	S. $\frac{1}{4}$ E. N.N.W.	Rate.	Rate.
				$1\frac{1}{2}$ S.E. $\frac{1}{4}$ S. $1\frac{1}{2}$ N.W. $\frac{1}{4}$ N.	$1\frac{1}{2}$ F $1\frac{1}{2}$ E
On a line joining Muck Island and Corsewall Point.	Close to Muck Island the stream attains great strength, the flood turning round Blackhead into the Lough of Belfast, but at a few miles off shore it runs straight on for the Copeland Islands.	Muck Island.	S. by E. $\frac{1}{4}$ E. N. by W. $\frac{1}{4}$ W.	$1\frac{1}{2}$	$1\frac{1}{2}$ F $1\frac{1}{2}$ E
				$1\frac{1}{2}$ S. by E. $\frac{1}{4}$ E. $1\frac{1}{2}$ N. by W. $\frac{1}{4}$ W.	$1\frac{1}{2}$ F $1\frac{1}{2}$ E

The tides off Muck Island run from $3\frac{1}{2}$ to $4\frac{1}{2}$ knots close in, and occasion a race and heavy breaking sea at the springs; and in blowing weather there are races also off both Blackhead and Whitehead, and also the Gobbins; with the *ebb-tide* there is an eddy from half tide, close in with the shore, which may be taken advantage of by steamers at all times, and by sailing-vessels with a leading wind; but it does not extend sufficiently far off for sailing-vessels to benefit by it with a working wind, as they would be in danger of getting on the rocks if they

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

The 3rd quarter of the flood having turned to the northward, meets the tide through the Sound off the Deputy Reef, and they jointly strike off for the south end of the Copeland Islands and pass over the Bushes, and thence through the Channel between the Islands.

The eddy under Mew Island at this time rushes with great speed to the N.E. until it meets the true tide, and with it forms a race which sailing-vessels should avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

The last of the flood goes to the northward through the Sound, and splits off the south end of the Copeland, and one part runs for Mew Island, throwing off branches between the islands.

All about the Copeland Islands the eddies are very strong, and at night a vessel should be sure that she is outside the drift of the point of Mew Island.

of the Stream.		Rate.	From	Remarks on the Tides near the Land.	Position.
5 Miles.					
F E.S.E. E N.W. by W.	2 1½		Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
F S. ½ E. E N. ½ W.	1½ 1½		Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.

After passing Whitehead, the tide slacks considerably as you enter the Lough. With the flood there is a strong eddy under Muck Island, which will be found very useful to steamers and even sailing-vessels beating along this coast; with a northerly wind they will do well to keep close in with the shore hereabout, as the strength of the flood strikes off from Muck Island in a S.E. direction, till it meets the stream which passes the eastern side of the Maidens, when it takes a channel direction; the meeting of these two tides appear to have occasioned a deep ditch, in which will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.	Position.
Near the Mull of Cantyre the stream runs 5 knots, and occasions a heavy dangerous sea in bad weather; with either tide, quite close in, there is an eddy. From the Mull of Cantyre the flood takes a direction nearly for Sanda Island, and divides off its western end: one part passing inside the island and up Kilbrennen Sound, the other running on for the Clyde.	On a line joining Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

By RICHARD HOSKYN, STAFF COMMANDER R.N.,

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Rate of tide.

ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{2}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.

Eddy from Tor Point through the Sound.

On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.

Eddy on south shore.

To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and true streams.

Ebb stream.

During the first hour and half, the ebb stream sets round the Rue Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{2}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-more, which may be attended with danger to small vessels.

Eddy in Church Bay.

Dangerous overfall.

Direction of ebb.

The eddy from Church Bay has now forced the main stream into a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.

Flood stream.

The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, and rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the eastward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island; at the junction of the eddy and true streams there are great overfalls off Altacarry Head, and again off the Rue as mentioned above.

Eddy to eastward of Island.

Navigation of Sound.

With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.

Streams off Bengore Head.

Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

At the Skerry Islets the *ebb stream* sets fair through the anchorage and Sound to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in its passage between Ramore Head and the Carr Rocks, and creating a very troublesome sea.

Streams near the Skerry Islet.

The flood stream sets from Ramore Head towards the Carr Rocks; when the Sound is entered it sets fair through.

In Broad Sound it sets down on the Little Skerry, while the ebb inclines to the northward through the Sound.

At the anchorage under the Great Skerry there is little tide felt, on the flood it is slack water at half tide, on the ebb with the last quarter, while on the north side of the rocks the stream runs with a velocity of 3 knots.

As we proceed to the westward towards Lough Foyle the tide loses much of its strength, north of the mouth of the Bann, 3 miles off shore its average rate at springs is $1\frac{3}{4}$ knots.

To the westward.

There is an eddy tide all the way along the shore from the Skerry Islets to the mouth of the Bann, commencing at half tide, the line of its junction with the main stream being marked by a strong rippling.

Eddy.

Two miles north of Port Stewart the channel stream turns to the eastward 1 hour and 40 minutes after low water at Liverpool, or at high water on the adjoining shore, and to the westward 31 minutes after high water at Liverpool, or three quarters of an hour before low water on the adjoining shore, so that, on this part of the coast, the tide wave (with reference to its head at Liverpool) being nearly reversed, we witness (what to a person watching the rise and fall of the tide on the shore appears at first sight so anomalous) the whole of the ebb stream coming from the ocean, while the flood comes from the opposite quarter.

Off Port Stewart.

High and low water not occasioned by tidal stream,

Referring the tidal stream to the head of the tide at Liverpool, and the varying times of high water to the undulation of the tide wave, this apparent anomaly disappears.

but by tidal wave.

All this coast to the westward of Fair Head is subject to a ground swell, in fine weather the commencement of the east-going stream is made apparent by the sudden appearance of the swell, resuming again a comparative state of quiet when the west-going stream makes.

Ground swell.

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE TIDE AT DOVER.

Streams turn with the tides of Dover.

IN the English Channel, as before stated (page 120), the time of high water *at Dover* is to be taken as the standard, so that whenever either the time of the turn or the direction of the stream is required to be known, the time of the ship is to be compared with the time of high water for the day at the standard place, and the interval sought in the table which accompanies these remarks, and in the column answering to the ship's position will be found the information required.*

Tidal Compartments.

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channels, for the courses of the stream in the mixed tides are so changeable that a very different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, whether N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

1st Compartment.

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining Ushant and Scilly.*

2d Compartment.

The 2d compartment comprises a space eastward of the before-mentioned line from Ushant to Scilly, and as far as a *line joining the Start and the Casquets.* In this part of the Channel there is a mixed tide, partaking of the joint directions of the Channel and Offing streams.

3d Compartment.

The 3d compartment is bounded on the west by the line joining the Casquets and the Start, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets into the true Channel stream which sets straight up and down Channel in the fairway, and will always carry a vessel *towards Beachy Head* while the water is *rising at Dover*, and *from it* while it is *falling there.*

4th Compartment.

The 4th compartment comprises the Gulf of St. Malo, an estuary which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity; and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets sharply *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across and out of* the Gulf, the north-eastern part of the stream sweeping round the Casquets towards Alderney, and through the Russel and other Channels about Guernsey towards the race of Alderney.

5th Compartment.

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the flood tide the western half of the bay is partly in eddy, and the tide slacks in all that part nearly an hour before high water at Dover, whilst in the eastern half of the bay it runs about half an hour longer than at Dover,

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

so that here a ship beating up Channel towards the end of a rising tide at Dover may prolong the tide in her favour by standing close over to the French Coast eastward of Havre. On approaching Boulogne, however, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and are turned down upon the French Coast, so that a ship, which on the English side would at this time have a stream setting straight up Channel, here encounters one upon her beam, sweeping her down towards the Somme, and hence probably the cause of some of the many disastrous losses which have occurred in this part of the Channel.

6th Compartment.

The 6th compartment is between Beachy Head and the North Foreland, and the Somme and Dunkerque. In this space the streams from the Channel and North Sea *meet* while the water is *rising* at Dover, and *separate* while it is *falling* there. The point of union and separation is not, however, stationary, but moves from west to east both on the rising and falling water. For instance, an hour after high water at Dover the separation begins off Beachy Head; in two hours it has reached Hastings, in three hours Rye, and so it creeps on until at low water it has gained the line extending from the North Foreland to Dunkerque. At this time the offing streams on both sides have done, and it is slack water all over the North Sea and English Channel as far as the true tide extends; but the stream does not at this time cease in the intermediate tide. When the water at Dover begins to rise, the stream on either side sets *towards Dover*, and that from the North Sea consequently *goes with the intermediate* tide, which had not yet ceased running to the westward, while the other, the Channel stream, *opposes* it, and this opposition continues throughout the rising tide at Dover; the point of meeting gradually shifting its position eastward as the tide advances on the shore.* About the time when the water at Dover has done rising, the line of meeting has reached the North Foreland, and the streams are now slack over the Channels east and west, leaving the intermediate stream running alone as before to the eastward. The next hour finds the offing streams made down east and west, so that now the intermediate stream falls in with the North Sea stream and goes with it, whilst on the west it separates from the Channel stream, splitting at the same point, Beachy Head, as at first.

Such is the general description of the course and routine of the tidal streams of the English Channel and intermediate tide, a careful perusal of which will enable the reader the more readily to understand the directions and tables annexed.

* The place of *meeting* begins off Beachy Head at *five hours before* high water on the *same spot* as that of the *separation* at *one hour after* high water; the place of *four hours before* high water is nearly the same as that of the separation at *two hours after*; and so on nearly with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every HOUR of the TIDE at DOVER.

COMPARTMENT I.

Westward of a Line joining Ushant and the Land's End.

Hours.	North Side of Latitude 49°00' N.					49°00' N.	
	West part.	Rate.	Near Scilly.	Rate.	Save		Rate.
After High Water, Dover.	1 W.N.W. $\frac{1}{2}$ W.	Greatest rate, springs, 1'50 knots.	N.N.W. $\frac{1}{2}$ W.	Greatest rate, springs, 1'50 knots.	N	N. by W. $\frac{1}{2}$ W. E.N.E. $\frac{1}{2}$ E E.N.E. $\frac{1}{2}$ E N.E. by E. $\frac{1}{2}$ E Turning. S. by E. $\frac{1}{2}$ E Draining. S.W. $\frac{1}{2}$ W. S.W. $\frac{1}{2}$ S. S.W. by W. $\frac{1}{2}$ W.	Greatest rate, springs, 1'50 knots.
	2 N. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N.N.E.		
	3 N.E. $\frac{1}{2}$ E.		N.N.E.		N.E. $\frac{1}{2}$ N.		
	4 E.N.E. $\frac{1}{2}$ E.		N.N.E.		N.E. $\frac{1}{2}$ E.		
	5 E.N.E. $\frac{1}{2}$ E.		N.E. by E.		N.E. $\frac{1}{2}$ E.		
	6 E. $\frac{1}{2}$ S.		E. $\frac{1}{2}$ S.		E.N.E. $\frac{1}{2}$ E.		
Before High Water, Dover.	1 S.E. by E. $\frac{1}{2}$ E.	Greatest rate, springs, 1'50 knots.	-	Greatest rate, springs, 1'50 knots.	S. $\frac{1}{2}$ W.		
	2 S. $\frac{1}{2}$ E.		South.		S.S.W. $\frac{1}{2}$ W.		
	3 S.S.W. $\frac{1}{2}$ W.		S.W.		S.S.W. $\frac{1}{2}$ W.		
	4 S.W. by W.		S.W. by W.		S.W. $\frac{1}{2}$ S.		
	5 W.S.W. $\frac{1}{2}$ W.		S.W. by W.		W.S.W.		

COMPARTMENT II.

Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Ile.

Hours.	North Side of the Channel.					REMARKS.	South Side of the Channel.				
	West part.	Rate.	Centre.	Rate.	East part.		West part.	Rate.	Centre.	Rate.	East part.
After High Water, Dover.	1 W.N.W. $\frac{1}{2}$ W.	Greatest rate, springs, 2'00 knots.	W. $\frac{1}{2}$ N.	Greatest rate, springs, 1'50 knots.	W. $\frac{1}{2}$ N.	{ W. $\frac{1}{2}$ S. near Hurd's Deep. }	W. $\frac{1}{2}$ S.	Greatest rate, springs, 1'50 knots.	W. $\frac{1}{2}$ N.	Greatest rate, springs, 1'50 knots.	W. $\frac{1}{2}$ S.
	2 Turning.		N.W. by W. $\frac{1}{2}$ W.		W. $\frac{1}{2}$ N.		Slack.		West.		W. by S.
	3 N. $\frac{1}{2}$ E.		W. $\frac{1}{2}$ N.		West.		East.		Slack.		W.S.W.
	4 E. $\frac{1}{2}$ S.		Slack.		S. $\frac{1}{2}$ W.		E. by N.		E.S.E. $\frac{1}{2}$ E.		S.E. by S.
	5 East.		E. $\frac{1}{2}$ S.		S.E. $\frac{1}{2}$ S.		E.N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ S.		S.W. by E. $\frac{1}{2}$ S.
	6 E. by S.		E. $\frac{1}{2}$ S.		E.S.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		S.W. by E. $\frac{1}{2}$ S.		S.E. $\frac{1}{2}$ S.
Before High Water, Dover.	1 E.S.E. $\frac{1}{2}$ E.	Greatest rate, springs, 2'00 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E. by S.	{ W. $\frac{1}{2}$ S. near Hurd's Deep. }	E. $\frac{1}{2}$ S.	Greatest rate, springs, 1'50 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E.S.E. $\frac{1}{2}$ E.
	2 Slack.		E.S.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ S.		N.W. by E. $\frac{1}{2}$ S.		Slack.		E. $\frac{1}{2}$ N.
	3 Turning.		Slack.		E. $\frac{1}{2}$ S.		Slack.		W.N.W.		North.
	4 W. by N.		W. $\frac{1}{2}$ N.		Turning.		S.W. by W. $\frac{1}{2}$ W.		Slack.		W.N.W. $\frac{1}{2}$ W.
	5 W. $\frac{1}{2}$ S.		W. $\frac{1}{2}$ N.		W.S.W. $\frac{1}{2}$ W.		S.W. by W.		W. by N.		N.W. $\frac{1}{2}$ W.

COMPARTMENT III.

Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.	Off Cape Barbour.	Rate.
After High Water, Dover.	1 W. $\frac{1}{2}$ N.	Greatest rate, } flood 2'30 } ebb 2'40 } knots.	W.N.W. $\frac{1}{2}$ W.	Greatest rate, } flood 2'30 } ebb 2'40 } knots.	Turning.	Greatest rate, } flood 2'00 } ebb 2'40 } knots.		W. $\frac{1}{2}$ S.	Greatest rate, } flood 2'15 } ebb 2'40 } knots.	N.W.	Greatest rate, } flood 2'40 } ebb 2'40 } knots.
	2 W.N.W. $\frac{1}{2}$ W.		N.W. by W. $\frac{1}{2}$ W.		W.N.W. $\frac{1}{2}$ W.			W. $\frac{1}{2}$ S.		N.W.	
	3 W. $\frac{1}{2}$ N.		N.W. by W. $\frac{1}{2}$ W.		W.N.W. $\frac{1}{2}$ W.			W. $\frac{1}{2}$ S.		N.W.	
	4 W. $\frac{1}{2}$ S.		W.N.W.		W. $\frac{1}{2}$ N.			W.S.W.		N.W.	
	5 W. $\frac{1}{2}$ S.		W.N.W.		W. by N.			W.S.W. $\frac{1}{2}$ W.		N.W.	
	6 N.N.E. $\frac{1}{2}$ E.		W.N.W. $\frac{1}{2}$ W.		W. by N.			Slack.		N.W.	
Before High Water, Dover.	1 E. $\frac{1}{2}$ S.	Greatest rate, } flood 2'30 } ebb 2'40 } knots.	E.S.E.	Greatest rate, } flood 2'30 } ebb 2'40 } knots.	E.S.E. $\frac{1}{2}$ E.	Greatest rate, } flood 2'00 } ebb 2'40 } knots.		E. $\frac{1}{2}$ S.	Greatest rate, } flood 2'15 } ebb 2'40 } knots.	S.E.	Greatest rate, } flood 2'40 } ebb 2'40 } knots.
	2 E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.			E. $\frac{1}{2}$ S.		S.E.	
	3 E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.			E. $\frac{1}{2}$ S.		S.E.	
	4 E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.			E. $\frac{1}{2}$ S.		S.E.	
	5 E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.			E. $\frac{1}{2}$ N.		S.E.	
	6 E.S.E. $\frac{1}{2}$ S.				E. $\frac{1}{2}$ S.			E.N.E.		S.E.	

COMPARTMENT IV.

Entrance of Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island.

Hours.	12 miles from Brehat Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
	Course.	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W.	Greatest rate, springs, uncertain knots.	W. ¼ N.	Greatest rate, springs, uncertain knots.		W. ¼ N.	Greatest rate, springs, uncertain knots.	W. ¼ S.	Greatest rate, springs, knots.	S.W. by W. ¼ W.	Greatest rate, springs, 5 to 7 knots.
	2 S. ½ W.		S. ¼ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
	3 S. ¾ W.		S. ¾ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¾ W.	
	4 S.E. ¼ S.		S.S.E. ¼ E.			S.E. by E. ½ E.		S. by E. ¼ E.		S.W. ¼ S.	
	5 S.E. ¼ S.		S.E. ¼ E.			S.E. by E. ½ E.		S.E. ½ E.		S.W. ¼ S.	
	6 S.E. ½ S.		S.E. ¼ S.			S.E. by E. ½ E.		S.E. ½ E.		N.E. by E. ¾ E.	
Before High Water, Dover.	5 S.E. ¼ E.	Greatest rate, springs, uncertain knots.	S.E. by E.	Greatest rate, springs, uncertain knots.		{ S.E. by E. ½ E. E. ¼ N. S.E. by E. ½ E. E. ½ N. }	Greatest rate, springs, uncertain knots.	E. ¼ N.	Greatest rate, springs, knots.	N.E. by E. ¾ E.	Greatest rate, springs, 5 to 7 knots.
	4 ..		..			..		N.E. ½ N.		N.E. by E. ¾ E.
	3 N.W. by W.		N.W. ½ N.			..		N.E. ½ N.		N.E. ¼ N.	
	2 N.W. by W.		N.W. ½ W.			N. by W. ¾ W.		N.E. by E. ¼ E.		N.E. ¼ N.	
	1 N.W. ¾ W.		W.N.W. ¼ W.			N. by W. ¾ W.		N.W. ½ W.		N.E. ¼ N.	

COMPARTMENT V.

In the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

Hours.	West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
After High Water, Dover.	1 N.N.W. ¼ W.	knots. 4.20 flood 5.70 ebb	N.W. by W. ¾ W.	knots. 3.20 flood 3.20 ebb	W. ½ N.	knots. 3.30 flood 3.00 ebb	
	2 N.N.W. ½ W.		N.W. by W. ¾ W.		W. ¾ S.		
	3 N.N. W.		N.W. by W. ¾ W.		W.N.W. ¾ W.		
	4 N.N.W. ¾ W.		N.W. by W. ¾ W.		W. ¼ N.		
	5 N. by W. ¾ W.		N.W. by W. ¼ W.		W. ¼ N.		
	6 Slack.		N.W. by W. ¼ W.		W. ¼ S.		
Before High Water, Dover.	5 S.S.E.	Greatest rate, springs, -	S.E. by E. ¾ E.	Greatest rate, springs, -	W. ¼ S.	Greatest rate, springs, -	
	4 S.S.E.		S.E. by E. ¾ E.		E.N.E. ¼ E.		
	3 S.S.E.		S.E. by E. ¾ E.		E.N.E. ½ E.		
	2 S.E. by S.		S.E. by E. ¾ E.		E.N.E. ¾ E.		
	1 S.E. by S.		S.E. by E. ¾ E.		E.N.E. ¾ E.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and
" the North Foreland and Dunkerque.

Hours.	REMARKS.	West of	East of	Off Southsand Head.		Off Northsand Head.	
		Line of Separation.		Course.	Rate.	Course.	Rate.
After High Water, Dover.	{ The Tides separate on a line joining— Beachy Head and St. Valery	W. by N.	N.E. by E. ¼ E.	N.E. ¼ E.	Greatest rate, springs, 3.3 knots.	N.N.E.	
	Hastings and Treport	W. ½ N.	N.E. by E. ¼ E.	N.E. ¾ E.		N.N.E.	
	Hastings and Cayeux	W. ¼ N.	E.N.E.	N.F. by E. ½ E.		N.E. ¼ E.	
	Folkstone and Calais	W. by S.	E.N.E.	N.E. by E. ¾ E.		E. by S.	
	South Foreland and Point Gravelines . .	s.w. by w. ¼ w.	N.E. by E. ½ E.				
	{ Ramsgate and Nieuport, passing over North Sand Head, the South Line of the Falls, and the banks off Nieuport	W. by S.	{ E. ¼ N. and Northward. }	S.W. ¼ S.		S.S.W.	
Before High Water, Dover.	{ The Tides meet on a line joining— Beachy Head and Point Ailly	Tides meet. E.S.E.		s.w. by w. ¼ w.	S.W.	S.S.W.	
	{ Bexhill and Cayeux, both streams turning down towards the "Somme"	S.S.E. ½ E.	S. by W. ¼ W.	S.W. ¾ W.		S.S.W.	
	{ The Tides meet on a line joining Rye and the Somme, passing over the Bassurelle, both tides setting to the Somme	S.E. by E. ¼ E.	S.W. by W.	W.S.W. ¼ W.		S.S.W.	
	{ The Tides meet on a line joining— Dungeness and Touquet Point	E. by N.	W.S.W. ¾ W.	W. ¾ N.		S.S.W.	
	Do. Dover and Dunkerque nearly	N.E. by E. ½ E.	W.S.W.	N.N.E.		S.S.W.	

SECTION III.

TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light and the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
True Stream.*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at that place*.* This stream sets nearly N.E. and S.W., except near the coasts, where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz., at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, and 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel of 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel of 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel of 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel of 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and the Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly 40 minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGOLAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.
Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles north of North Foreland.		Galloper Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. by N.	Greatest rate, springs, 2½ knots.	Slack.	Greatest rate, springs, 3½ knots.	N.E.	Greatest rate, springs, 2½ knots.	N.N.W. ¼ W.	1'80	N.E. ½ E.	Greatest rate, springs, 2½ knots.
	2 Slack.		N.E. by E. ¾ E.		N.E.		N. ¼ E.	1'20	N.E. by E.	
	3 E. ¾ S.		E.N.E. ¾ E.		N.E.		N.E. ¼ E.	1'18	N.E. by E.	
	4 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'46	N.E. ¾ E.	
	5 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'60	N.E. by E.	
	6 E. ¼ S.		E.N.E. ¾ E.		N.E.		S.E. ¼ E.	1'45	N.E. by E.	
Before High Water, Dover.	5 E. ¾ S.	Greatest rate, springs, 2½ knots.	..	Greatest rate, springs, 3½ knots.	S.W. ¼ S.	Greatest rate, springs, 2½ knots.	S.S.E. ½ E.	1'30	S. ¾ W.	Greatest rate, springs, 2½ knots.
	4 Slack.		S.W. by W. ¾ W.		S.W. ¼ S.		S. ¾ W.	1'36	S.W. ¼ S.	
	3 W. ¼ S.		S.W. by W. ¾ W.		S.W. ¼ S.		S.W. ½ S.	1'60	S.W. by W.	
	2 W. ¼ S.		W.S.W. ¾ W.		S.W. ¼ S.		S.W. ½ W.	1'65	S.W. by W. ½ W.	
	1 W. ¼ S.		W. ½ S.		S.W. ¼ S.		W.S.W.	1'40	W.S.W.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hours.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 N.E. ¼ E.	Greatest rate, springs, {flood 2½ knots, ebb 2½ knots}	E.N.E. ¼ E.	Greatest rate, springs, {flood 2½ to 3½ knots, ebb 2½ to 3½ knots}	N.E. by E. ¾ E.	Greatest rate, springs, 2½ to 2½ knots.	Stream from the Schelde N.W. by W. to 3° E. turning sharply to N.E. Stream from the Schelde N.W. by W. to 2½° E. turning sharply to N.N.E. ½ E.
	2 N.E. ½ E.		E.N.E.		N.E. by E.		
	3 N.E.		N.E.		N.E. ¼ E.		
	4 N.E. by E. ¾ E.		N.E. ½ E.		N.E. ½ E.		
	5 N.E. ½ E.		N.E. ½ E.		N.E. ½ E.		
	6 N.E. ¼ E.		N.E.		N.N.E. ¼ E.		
Before High Water, Dover.	5 S.W. ¼ S.	Greatest rate, springs, 2½ knots.	S.W. by W. ¾ W.	Greatest rate, springs, 2½ knots.	W.S.W.	Greatest rate, springs, 2½ knots.	
	4 S.W.		S.W. ½ W.		S.W. ¾ W.		
	3 S.W.		S.W.		S.W. ¾ W.		
	2 S.W.		S.W.		S.W. ½ W.		
	1 S.W. ¼ S.		S.W.		S.W. ¼ W.		

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.	REMARKS.	
After High Water, Dover.	Stream runs northward.	
1		
2		
3		
4		
5		
Before High Water, Dover.	Stream runs southward.	
5		
4		
3		
2		
1		

Taking the direction of the land, except close to the banks, for which special instructions are necessary.

COMPARTMENT IX.—continued.

Hours.	Shipwash Light Vessel.		Stanford Light Vessel.		St. Nicholas Gat Light Vessel.		Cockle Light Vessel.		Newarp Light Vessel.		Hasborough Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1	E.N.E. ¼ E.	N.E. ¼ N.		N. ¼ E.		N.N.E.		N. 1/4 W.		N. by W. ½ W.	
	2	E.N.E. ¼ E.	N.E. ¼ N.		N. ¼ E.		N.N.E.		N. 1/4 W.		N. by W. ½ W.	
	3	E.N.E. ¼ E.	N.E. ¼ N.		N. ¼ E.		N.N.E.		N. 1/4 W.		N. by W. ½ W.	
	4	E.N.E. ¼ E.	N.E. ¼ N.		N. ½ W.		N.N.E.		N. 1/4 W.		N. by W. ½ W.	
	5	N.E. by E. ¾ E.	N.E. ¾ E.		N. ¾ W.		N.N.E.		N. 1/4 W.		N. by W. ½ W.	
	6	N.E.	Slack		N. by W.		S. ¼ W. on the turn.		N. 1/4 E.		S. by E.	
Before Low Water, Dover.	5	S.W. ¾ W.	S.W. ¾ S.		S. ¼ E.		S. 1/4 W.		S. 1/4 E.		S. by E. ¼ E.	
	4	S.W. by W. ¼ W.	S.W. ¾ S.		S. ¼ E.		S. 1/4 W.		S. 1/4 E.		S. by E. ¼ E.	
	3	S.W. by W. ¼ W.	S.W. ¾ S.		S. ½ W.		S. 1/4 W.		S. 1/4 E.		S. by E. ¼ E.	
	2	S.W. by W. ¼ W.	S.W. by S.		S. ¾ W.		S. 1/4 W.		S. 1/4 E.		S.S.E.	
	1	S.W. by W. ¼ W.	S.S.W. ¾ W.		S. by W. ¼ W.		S. 1/4 W.		S. 1/4 E.		S by E.	

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1	N.E. ½ N.	N.E.		N.E. ¾ N. °		N. by W.		° Turning sharply off for the Leman and Ower.
	2	N.E. ¼ N.	N.E. ½ N.		N.E. ¾ N.		N. ½ E.		
	3	N.E. ¼ N.	N.E. ¼ E.		N.N.E. ¼ E.		N.N.E. ¼ E.		
	4	N.E.	N.E. ¼ N.		N.E. ¼ E.		N. ¼ W.		
	5	N.E. ¼ N.	N.E. ¼ N.		N.E. ¼ N.		N. ½ W.		
	6	N.E. ¾ N.	N.E. ¼ N.		N.E. by N.		N.N.E. ¼ E.		
Before High Water, Dover.	5	S.W. ½ S.	S.W. ¾ W.		S. ½ E.		S. ¾ W.		Greatest rate, springs, { flood 1'40 } knots. { ebb 1'40 } knots.
	4	S.W.	S.W. ¾ S.		South.		S. ¾ W.		
	3	S.W. ¼ S.	S.W. ¼ S.		S. by W. ¼ W.		S. by W.		
	2	S.W.	S.W. ½ S.		S.S.W. ¼ W.		S.S.W.		
	1	S.W. ¼ W.	S.W. ¼ S.		S.W. ¼ S.		S. by W. ¼ W.		

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1	N.E.	Slack.		N.E. ½ N.		N.E. ½ N.		Stream setting round Texel south-western.
	2	N.E.	N.E.		N.E.		N.E. ¼ N.		
	3	N.E.	N.E.		N.E.		N.E.		
	4	N.E. ½ N.	N.E.		N.E. ¼ E.		N.E.		
	5	N.E. ¼ N.	N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		
	6	N.E. ¼ N.	N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		
Before High Water, Dover.	5	S.W. ¼ S.	S.W. ½ S.		S. by E. ½ E.		S.S.E. ¾ E.		Greatest rate, springs, { flood 1'70 } knots. { ebb 2'00 } knots.
	4	S.W. ¼ S.	S.W. ¼ S.		S.S.W.		South.		
	3	S.W. ¼ S.	S.W. ½ W.		S.W. ½ S.		S.W. ½ S.		
	2	S.W. ½ S.	S.W. ¾ W.		S.W. ½ S.		S.W. ½ S.		
	1	S.W. ¼ S.	S.W. ¼ W.		S.W. ½ S.		S.W. ½ S.		

COMPARTMENT XII.

Between the latitude 52° and 53° N. and from longitude 4° E. to the Coast of the Netherlands.

Hours.		REMARKS.	
After High Water, Dover.	1	Stream runs northward.	The stream takes the direction of the land, except close to the banks, for which special instructions are necessary.
	2		
	3		
	4		
	5		
	6		
Before High Water, Dover.	3	Stream runs southward.	
	4		
	5		
	6		
	7		

COMPARTMENT XIII.

Between the latitude 53° and 54° N. and from longitude 1° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	N.W. Quarter.	Leman and Ower Light Vessel.		REMARKS.
							Course.	Rate.	
After High Water, Dover.	1 N.N.W. ¼ W.	Greatest rate, springs, { flood 2'25 } ebb 2'25 } knots.	1 N. by W. ¼ W.	Greatest rate, springs, { flood 2'00 } ebb 2'30 } knots.	1 N.N.W. ¼ W.	1 N. ¼ W.	1 N. by W. ¾ W.	Greatest rate, springs, 2'0 knots.	Near the north point of Smith's Knoll the rates are, flood 2'6, ebb 3'0 knots.
	2 N.W. ¼ N.		2 N. by W. ¼ W.		2 North.	2 N. ¾ W.	2 N. by W. ¾ W.		
	3 N.N.W. ½ W.		3 N. ¼ E.		3 N. by E.	3 N. by W. ½ W.	3 N.N.W.		
	4 N.N.W. ¾ W.		4 N. ¼ E.		4 N.N.E.	4 N.W. ½ W.	4 N.N.W.		
	5 N.N.W. ¾ W.		5 N. ¼ E.		5 E.N.E.	5 S. by W. ¼ W.	5 N.N.W.		
	6 - - -		6 N.N.E. ¼ E.		6 S.E.	6 S. ¼ E.	6 Slack.		
Before High Water, Dover.	3 S.S.E. ¾ E.		3 S.S.E. ¾ E.		3 S.E. ½ S.	3 S. ½ E.	3 S.S.E.		
	4 S.S.E. ¾ E.		4 S.S.E. ¾ E.		4 S. ¼ E.	4 S. by E. ¼ E.	4 S.S.E.		
	5 S.S.E. ½ E.		5 S. by E.		5 South.	5 S.S.E. ¼ E.	5 S.S.E.		
	6 S. by E.		6 S. ¼ E.		6 S. ¾ W.	6 E.S.E. ¼ E.	6 S.S.E.		
	7 S.S.E. ¼ E.		7 S. by W.		7 South.	7 N.E. by N.	7 S.S.E.		
	- - -		- - -		- - -	- - -	- - -		

COMPARTMENT XIV.

Between the latitude 53° and 54° N. and 3° to 5° E. longitude.

Hour.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. ½ E.	Greatest rate, } flood 2.50 } knots. } ebb 5.75	E.N.E.	Greatest rate, springs, 3.25 knots.	N. by W. ½ W.	Greatest rate, springs, 2.5 knots.
	2 N.N.W. ¼ W.		S.W. by S.		N.N.W.	
	3 -		S.W. ½ S.		N.W. ¾ N.	
	4 S.W.		S.W.		W. ¾ S.	
	5 S.W. ½ W.		S.W.		S.W. ¼ S.	
	6 S.W. ¾ S.		S.W.		S. ¼ E.	
	5 S. ¾ E.		S.W.		S. by E. ¾ E.	
	4 S. by E. ¾ E.		N.E. by E.		S.S.E.	
	3 S.S.W. ¼ W.		N.E. by E. ½ E.		S.E.	
	2 N. by E. ¼ E.		E.N.E.		E. ½ S.	
Before High Water, Dover.	1 N.N.E. ¼ E.		E.N.E.		N.E. ½ N.	

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by W. ½ W.		N.N.W. ½ W.		N.W. ¼ W.		N.W. by W. ¾ W.	
	2 N. by W. ½ W.		N.W. ¼ N.		N.W. by W. ¼ W.		W.N.W. ¼ W.	
	3 N.W. by N.		N.W. ¼ W.		N.W. by W. ¼ W.		W. by N.	
	4 S. ¼ E.		W.N.W. ½ W.		N.W. ¾ N.		N. ¾ W.	
	5 S. ½ E.		W. ½ S.		N. by W.		N.E. ½ N.	
	6 S.S.E.		S. by E.		E. by N.		E. by N.	
	5 S.E. ½ S.		S.E. ¾ S.		E.S.E. ¾ E.		E. ¾ N.	
	4 S.E. by E.		S.E. ¼ E.		E.S.E. ¾ E.		E. ½ S.	
	3 E. ¼ S.		S.E. ½ E.		E.S.E. ¾ E.		E. by S.	
	2 N.E. ¼ N.		S.E. by E. ¼ E.		E.S.E.		S.E.	
Before High Water, Dover.	1 N. by E. ¼ E.		E.N.E. ½ E.		S. ¼ W.		S. by E. ½ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W. ¾ W.	Greatest rate, 1 knot.	W. by N.	Greatest rate, 1 knot.	West		E.N.E. ¾ E.	Greatest rate, 1 knot.
	2 N.W. by W.		W.N.W.		W.N.W.		N.E. ½ E.	
	3 W.N.W.		W.N.W.		W.N.W.		N.W.	
	4 W.N.W.		W. by N.		W.N.W.		W.N.W.	
	5 W.N.W.		W.N.W.		W.N.W.		N.W. by W.	
	6 W.N.W.		W.N.W.		W.N.W. ½ W.		W. ½ S.	
	5 E.S.E. ½ E.		S.E. by E. ½ E.		S.S.E. ½ E.		W. by S.	
	4 S.E. by E. ½ E.		S.E. by E. ½ E.		S.E. by E. ½ E.		S.S.W. ¼ W.	
	3 S.E. ½ E.		E.S.E. ½ E.		S.E. by E. ½ E.		S. ¾ E.	
	2 S.E. ¼ E.		E.S.E. ¼ E.		S.E. by E. ½ E.		S.E. by E.	
Before High Water, Dover.	1 S.E. by E. ½ E.		E.S.E. ¼ E.		S.E. by E. ½ E.		E.N.E. ¾ E.	

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

COMPARTMENT XVII.

On the parallel of 55° N.

Hour.	0° E.		1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.W.	½	Slack.		N.N.E.		W. ½ S.		N.W. ½ N.	
	2 S. by W. ½ W.	½	S.W. ½ W.		W.S.W.		W. ½ N.		N.W. ½ W.	
	3 S. by E.	1½	S.S.W. ½ W.		N.S.W. ½ W.		W. ½ N.		N.W.	
	4 S. ½ E.	1	S. by W. ½ W.		S.W. by W.		N.W. by W.		N.W. ½ W.	
	5 S. ½ E.	½	S. by W. ½ W.		S. ½ E.		S.W. by W. ½ W.		West.	
	6 S. ½ E.	½	S. ½ W.		S. by E. ½ E.		S. by E.		S.S.E. ½ E.	
Before High Water, Dover.	1 S.E. ½ S.	½	S. ½ E.		E.S.E. ½ E.		S. ½ E.		S.E. by E. ½ E.	
	2 N.N.E. ½ E.	½	E.N.E. ½ E.		E. ½ S.		S.E. by E.		S.E. by E. ½ E.	
	3 N. ½ W.	1½	N. by E. ½ E.		E. by N.		E. by S.		E. ½ S.	
	4 N. ½ W.	1	N.N.E.		E. ½ N.		E. by S.		E. ½ N.	
	5 N. ½ W.	½	N. by E. ½ E.		N.E. by E.		N.E. by N.		N. by E. ½ E.	
				Greatest rate at springs 1 knot about half tide.		Greatest rate at springs 1 knot about half tide.		Greatest rate at springs 1 knot about half tide.		Greatest rate at springs 1 knot about half tide.

Hour.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W.		W. ½ N.		W.N.W. ½ W.		N. by W. ½ W.	
	2 W.N.W. ½ W.		W.N.W.		W.N.W. ½ W.		N. by W. ½ W.	
	3 W.N.W. ½ W.		N.W. by W. ½ W.		N.W. by W. ½ W.		N.W. ½ N.	
	4 N.W. by W. ½ W.		W.N.W. ½ W.		W.N.W. ½ W.		N.N.W. ½ W.	
	5 W. ½ N.		W.N.W. ½ W.		W. by N.		N.W.	
	6 Turning.		N.W. by W. ½ W.		W. ½ S.		N.W. by W. ½ W.	
Before High Water, Dover.	1 E. ½ S.		S.E. ½ S.		S.W. ½ W.		W. ½ S.	
	2 E.S.E. ½ E.		S.E. by S.		S. ½ E.		S. by W. ½ W.	
	3 E.S.E. ½ E.		S.S.E. ½ E.		S.S.E. ½ E.		S. ½ W.	
	4 E.S.E. ½ E.		S.S.E. ½ E.		S.E. by S.		S. ½ E.	
	5 E. ½ S.		S.S.E. ½ E.		S.E. by S.		S. by E. ½ E.	
		Greatest rate at springs 1 knot about half tide.		Greatest rate at springs 1 knot about half tide.		Greatest rate at springs 1 knot about half tide.		Greatest rate at springs 1 knot about half tide.

COMPARTMENT XVIII.

On the parallel of 56° N.

Hour.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.E. ½ E.		Slack.		N.W. ½ W.		N. ½ E.	
	2 Slack.		S.W. ½ W.		W.N.W.		N.N.W. ½ W.	
	3 S. ½ W.		S.W. ½ W.		N.W. ½ N.		N.W. ½ W.	
	4 S. ½ E.		W. by S.		N.W.		N.E. ½ E.	
	5 S. ½ E.		S. ½ E.		N. by W. ½ W.		N.E. by E. ½ E.	
	6 S. ½ E.		S. ½ E.		N. ½ W.		E. ½ S.	
Before High Water, Dover.	1 S.E. by E. ½ E.		E. by S.		N. by E. ½ E.		E. ½ N.	
	2 N.E. by E. ½ E.		E.N.E. ½ E.		N.E. ½ E.		E. ½ N.	
	3 N.E. ½ N.		E.N.E.		East.		N.E. by E. ½ E.	
	4 N.E. by N.		N.E. by E. ½ E.		N.E. by E.		E.N.E. ½ E.	
	5 N.E. ½ E.		N.E. by E.		North.		N.E. by E. ½ E.	
		Greatest rate at springs ½ knot about half tide.		Greatest rate at springs ½ knot about half tide.		Greatest rate at springs ½ knot about half tide.		Greatest rate at springs ½ knot about half tide.

TIDAL STREAMS

COMPARTMENT XVIII.—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	Turning.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
1	W. $\frac{1}{2}$ S.		N.N.W.		N.E. by N.		N. $\frac{1}{2}$ E.	
2	N.W. $\frac{1}{2}$ N.		N.N.W.		N. $\frac{1}{2}$ E.		N. $\frac{1}{2}$ W.	
3	N. by W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
4	N.N.E. $\frac{1}{2}$ E.		N. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
5	N.E. $\frac{1}{2}$ E.		N.N.E.		N. by W.		N. by W.	
Before High Water, Dover.	E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. by E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N. by W.		N.N.W. $\frac{1}{2}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
1	N.E. by E. $\frac{1}{2}$ E.		E.N.E. $\frac{1}{2}$ E.		N.E. $\frac{1}{2}$ E.		N. by E.	
2	E.N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		E. $\frac{1}{2}$ S.		S. by W.	
3	East.		E. $\frac{1}{2}$ S.		E. $\frac{1}{2}$ S.		S.W.S.	
4	E. $\frac{1}{2}$ N.		E. by S.		S.E. $\frac{1}{2}$ E.		S.W. $\frac{1}{2}$ W.	
5								

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	S. W. by S.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{2}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
1	S. W. by S.		S.W. $\frac{1}{2}$ S.		S.S.W.	
2	S. W. $\frac{1}{2}$ W.		S.W.		S. by W.	
3	N. $\frac{1}{2}$ W.		W.S.W. $\frac{1}{2}$ W.		S. by W.	
4	Slack.		Slack.		S. $\frac{1}{2}$ E.	
5	N.N.E. $\frac{1}{2}$ E.		N. by E. $\frac{1}{2}$ E.		Slack.	
Before High Water, Dover.	N.E. $\frac{1}{2}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	N.N.E.	Greatest rate $\frac{1}{2}$ knot about half tide.	N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
1	N.E.		N.N.E.		N. by E.	
2	N.E. by N.		N.N.E. $\frac{1}{2}$ E.		N. by E. $\frac{1}{2}$ E.	
3	N.E. by N.		N.E. $\frac{1}{2}$ N.		N.N.E. $\frac{1}{2}$ E.	
4	South.		E.N.E.		N. by E. $\frac{1}{2}$ E.	
5						

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	S.S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.	N. by E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.S.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
1	S.W. $\frac{1}{2}$ S.		S. $\frac{1}{2}$ E.		South.		N.W. by W. $\frac{1}{2}$ W.	
2	S.S.W. $\frac{1}{2}$ W.		S. by E.		S. by W. $\frac{1}{2}$ W.		W.N.W.	
3	S.W. $\frac{1}{2}$ S.		S.E. by S.		S.W. by W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.	
4	Slack.		E. by S.		Slack.		N. by W.	
5	N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		Slack.		N. by E.	
Before High Water, Dover.	N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	E. $\frac{1}{2}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	Turning.	Greatest rate $\frac{1}{2}$ knot about half tide.	N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
1	N. E. by E.		E. by N.		N.E. by N.		N.E. $\frac{1}{2}$ N.	
2	E.N.E. $\frac{1}{2}$ E.		East.		N.E. $\frac{1}{2}$ E.		N.E. by E. $\frac{1}{2}$ E.	
3	E.N.E. $\frac{1}{2}$ E.		East.		E. by N.		E.N.E.	
4	Slack.		S. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ S.	
5								

COMPARTMENT XIX.—continued.

Hours.	5°		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. ¼ E.	Greatest rate 1½ knot about half tide.	S. by E.	Greatest rate ¼ knot about half tide.	E.N.E.	Greatest rate ¾ knot about half tide.	S.S.E.	Rate 0·9 knot.
	2 N.E. by N.		South.		E.N.E. ¼ E.		Slack.	
	3 S.W.		S. by W.		E.N.E.		N.E. by N.	
	4 N.N.W.		N.N.E.		E.N.E.		N.E. ¾ N.	
	5 N. ¾ W.		North.		E.N.E.		North.	
	6 N. by E. ¼ E.		North.		N.N.E.		N. by E.	
Before High Water, Dover.	5 N.E.	Greatest rate 1½ knot about half tide.	N. by E.	Greatest rate ¼ knot about half tide.	N.E. ¾ E.	Greatest rate ¾ knot about half tide.	N.E. ¼ E.	
	4 N.E.		N.N.E. ¼ E.		N.E. by N.		N.N.E. ¾ E.	
	3 N.E. ¼ E.		N.E. ¼ E.		N.E.		N.E. by E. ¼ E.	
	2 E. ¾ N.		E. by N.		N.E.		N.E. by E. ¾ E.	
	1 East.		E. by N.		N.E.		E.N.E. ¼ E.	

COMPARTMENT XX.

On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 South.	Greatest rate 1 knot about half tide.	S.E.	Greatest rate 0·6 knot about half tide.	S.S.W.	Greatest rate 1 knot about half tide.		
	2 S.E. ¾ S.		S.E.		S.S.W.			
	3 East.		S. ¼ E.		S.S.W.			
	4 E. by S.		S.E. ¾ S.		Slack.			
	5 Slack.		Slack.		N.N.W. ¾ W.			
	6 S.W.		N. by W.		N.N.E.			
Before High Water, Dover.	5 W. ¾ N.	Greatest rate 1½ knot about half tide.	N.W. ¼ W.	Greatest rate 1½ knot about half tide.	N.N.E. ¾ E.	Greatest rate ¾ knot about half tide.		
	4 W.N.W. ¼ W.		N.W.		N.E.			
	3 N.W. by W. ¼ W.		N.W. by N.		N.E. ¾ E.			
	2 W. by N.		W. ¾ N.		S.S.E. ¼ E.			
	1 W. ¾ N.		S. ¾ E.		S.S.E. ¼ E.			

Hours.	1° E.		2° E.		3° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W.	Greatest rate ½ knot about half tide.	S.W.	Greatest rate ½ knot about half tide.	S. by E.	
	2 West.		W.S.W.		S. ¼ E.	
	3 Slack.		W.N.W. ¼ W.		S. ¼ W.	
	4 Slack.		N.W. ¼ N.		S.S.W.	
	5 N.N.E.		N. ¼ E.		S. ¾ W.	
	6 N.N.E.		N. by E.		E. by N.	
Before High Water, Dover.	5 N.N.E.	Greatest rate ½ knot about half tide.	N. by E.	Greatest rate ½ knot about half tide.	E.N.E.	
	4 N.N.E.		N. by E. ¼ E.		E.N.E.	
	3 N. by E. ¾ E.		N. by E.		E. by N.	
	2 Turning.		N.E. ¼ E.		E.S.E. ¼ E.	
	1 W. by N. ¼ N.		S.E.		S.E. by E.	

TIDAL STREAMS.

COMPARTMENT XXI.

On the parallel of 59° N.

Hours.	2° W.		1°		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. by S.	Greatest rate 1 knot about half tide.	S.S.W. ½ W.	Greatest rate 0·6 knot about half tide.	W.S.W.	Greatest rate ¾ knot about half tide.
	2 S. by W. ¾ W.		S.W. by S.		W.S.W. ¾ W.	
	3 S. ¾ W.		S.W. by S.		N. by E. ½ E.	
	4 S.W. by W. ½ W.		Slack.		N.E.	
	5 W. by N.		Slack.		N.E. ¼ E.	
	6 N.W. ½ W.		N. ¾ E.		N.E. by E.	
Before High Water, Dover.	5 N.N.W. ¾ W.	Greatest rate 1 knot about half tide.	N.N.W.	Greatest rate 0·6 knot about half tide.	N.E. by E.	Greatest rate ¾ knot about half tide.
	4 N.W. ½ N.		N.N.W.		E. by N.	
	3 W.N.W.		N.W. by N.		S.E. ¼ E.	
	2 S.W. by W. ½ W.		S.W. by W. ¼ W.		S.S.W. ½ W.	
	1 S.W. ¼ W.		S.W. ¾ S.		W.S.W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS ;
WITH THE RISE OF THE TIDE
AT SPRINGS AND NEAPS.

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Tasman, Melville, Smits, Swart, and Van Rhyn of the Dutch Navy.

Klint, Löwenorn, and Zahrtmann of the Danish and Swedish Navies.

Bauza, Malaspina, and Tofiño of the Spanish Navy.

U. S. Coast Survey under Professor A. D. Bache. Maury and Wilkes of the U. S. Navy.

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

T I M E

OR

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PRINCIPAL PLACES ON THE GLOBE ;

ARRANGED ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE ;

*With the Rise of the Tide at Springs and Neaps.**

When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
England, South Coast.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Scilly Is. (St. Agnes)	4 30	16	12	Teignmouth -	6 0	13	9½
— (St. Mary)	4 18	15½	11½	Torbay -	6 0	13½	10
— (Trescow)	4 22	16½	12½	Exmouth -	6 21	12½	8½
Penzance -	4 30	16½	12½	Lyme Regis -	6 21	11½	8½
Lizard (Perran } Vose Cove) - }	5 0	14½	10½	Bridport -	6 5	11½	7½
Coverack -	4 35	14½	11½	Chesilton -	6 13	10½	7
Helford (entrance)	4 43	15½	11½	Portland Breakwater	7 1	6½	4½
Falmouth -	4 57	16	12	Poole - {	9 10	6½	4½
— Truro } (Town Quay) - }	5 5	10	6	Christchurch - {	9 0	5	
Mevagizey -	5 4	15½	12	Needles Point -	9 46	7½	5
Fowey -	5 14	15	11½	Hurst, Camber - {	10 0	7½	6
East Looe -	5 26	16	13	Yarmouth -	12 0	7	6½
Plymouth Breakwater	5 37	15½	11½	West Cowes - {	10 45	12½	9½
— Sutton } Pool - }	5 32	15½	11½	Lymington - {	11 45	8	6
Devonport Dk. Yard	5 43	15½	11½	Beaulieu -	10 25	10	8½
Matash, R. Tamar	5 45	15	11	Calshot -	12 15	13	9½
Wargreen "	5 47	14½	10½	(Castle Point) }	10 30	13	9½
Centillie "	5 55	13½	9½	Southampton - {	12 45	8½	6
Salstock "	6 6	12½	8½	— Red-bridge - {	10 42	12 57	12½
Morewellham "	6 12	10½	6½	Portsmouth Dock } Yard - }	11 41	13½	10½
Weir Head "	6 17	5½	1½	— Portchester (off the } Castle) - }	11 46	6½†	4†
Warleigh Quay, } R. Tavy }	5 47	14½	10½	— Ports-bridge (a ½ mile } W. of bridge) - }	11 48		
Maristow "	5 47	8½	4½				
Pigbury B., R. Yealm	5 37	16½	11½				
— R. Erme	5 40	16½	11½				
— R. Avon	5 47	16½	11½				
Polt Head -	5 45	15?	11?				
Salcombe -	5 41	15	11½				
— Kings-bridge - }	5 46	40					
Dartmouth -	6 16	14½	10½				

* By the Rise of the tide is meant its vertical rise above the mean low water level of spring-tides.
† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Portsmouth Fareham (in Channel close to the Upper Quay) -	11 48	11½	8½	Caermarthen (Bar)	6 10	26	19½
Bridge -	11 51	7½	4½	Caldy Island -	6 0	24½	16½
Ryde -	11 20	13½		Tenby -	6 0	27	20
Bembridge Point -	11 0	14	10½	Milford (St. Ann Lighthouse) -	5 56	24	18
Chichester -	11 30	14	11	Pembroke Dk. Yard	6 12	21	15½
Pagham (entrance)	11 30	16½	12½	Benton Castle, Cleddau R. }	6 23	20	14½
Selsea Bill -	11 45	16½	12½	Landshipping " }	6 27	20	14½
Littlehampton -	11 36	14	11½	Little Milford Quay " }	6 31	19	13½
Arundel (Bar) -	11 35	16	11½	Haverfordwest " }	6 42	7½	2½
Arundel (Town) -	12 25			Smalls Light-house " }	6 0	21	
Shoreham -	11 34	18	13½	Ramsay Sound -	6 0	17	
Brighton -	11 15	19½	16	Fishguard -	6 56	11½	8½
Newhaven -	11 51	20	15	Newport -	7 0	12	9
Beachy Head -	11 20	20	15	Cardigan -	7 1	14	9
Hastings -	10 53	24	17½	New Quay -	7 30	15	
Rye Bay -	11 20	22	17½	Aberystwyth -	7 31	13½	10
Dungeness -	10 45	21½	19	Aberdovey -	8 0	14	
Folkstone -	11 7	20	16½	Sarn-y-bwch Reef -	7 40	14	
Dover -	11 12	18½	15	Barmouth -	7 41	17	13½
Deal -	11 15	16	12½	Sarn Badrig -	7 30	13	
Ramsgate -	11 44	15	12	Port Madoc -	7 30	17	
<i>England and Wales, West Coast.</i>				St. Tudwall Road -	7 45	14	
Scilly Isles (St. Agnes) -	4 30	16	12	Pwllhell -	7 46	13½	9½
Scilly Isles (St. Mary) -	4 27	16	12	Bardsey Id. -	7 40	14	
Cape Cornwall -	4 35	18½	13½	Porth-dyn-lleyn -	8 30	16	
St. Ives -	4 44	21	14	Caernarvon -	9 33	13½	10½
Padstow -	5 13	20½	16½	Holyhead -	10 11	16	12½
Boscawen -	5 15	25	17½	Amlwch -	10 30	18½	13½
Budehaven -	5 45	23	17	Beaumaris -	10 32	21½	16½
Lundy Island -	5 15	27	20	Air Point, R. Dee	10 54	25	19
Barnstaple (Bar) -	5 30	19	14	Chester (Crane Wharf) -	12 16	14	
Barnstaple (Bridge)	6 28	10½	7½	Liverpool -	11 23	26	20½
Appledore -	5 58	23	16½	Formby Point -	10 35	14	
Bideford -	6 7	16	12	Ribble Lighthouse	10 51	24	17
Ilfracombe -	5 42	27½	21½	Preston -	11 49	10	4½
Minehead -	6 30	33	26½	Fleetwood (Wyre Lt)	11 11	27	20½
Bridgewater Bar -	6 50	14	10	" (Port)	11 12	26½	19½
Weston-super-mare	6 54	37	28½	Lancaster -	11 16	8½	
Flatholm Islands -	6 54	37½	28½	Poulton-le-Sands -	11 26	27½	21½
Portishead -	7 16	41½	31	Piel Harbour (Pier)	11 5	28	21
Bristol (King Road)	6 56	44	33	Whitehaven -	11 14	23½	18½
Chepstow -	7 30	38	28½	Port Harrington -	11 5	26	14
Newport -	7 10	36	29	Workington -	11 4	20	15
Cardiff -	6 59	38	29	Maryport -	11 3	18	13
Barry Island -	6 39	35½	26	Abbey Head -	11 10	23	17½
Nash Point -	6 25	33	25	Southernness -	11 20	28	
Swansea (Mumghouse) }	6 1	27½	20½	Annan Foot -	11 56	20	14
Swansea (Mumghouse) }	6 8	29½	21½	Port Carlisle -	12 10	20	14
Swansea (Mumghouse) }	6 1	25½	18½	Point of Ayr -	11 7	20½	16½
Swansea (Mumghouse) }	5 49	23	16½	Douglas, I. of Man	11 12	20½	16
Swansea (Mumghouse) }	6 16	23	21	Ramsey -	11 12	19½	16
				Peel -	11 8	16½	13
				Calf Sound -	11 17	16½	13
				Port St. Mary -	11 10	20	16
				Castletown -	11 10	20	16

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Scotland, West Coast.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Solway (Tarn Point)	11 22	23	18	Duart, I. of Mull -	5 0	12	10
Kirkcudbright -	11 10	23		Loch Aline -	5 33	13½	10½
Newton Stewart } (Carty Quay) - }	12 0	12	6	Tobermory, Mull I.	5 36	13	9½
Wigton -	11 30			Loch Cuan " -	5 36	13	9½
Garliestown -		17	12	Strontian, L. Sunart	5 40	13½	
Port William -	11 10	18	10	Iona Sound -	5 11	11½	8½
Mull of Galloway -	11 15	15?	12?	Bunessan -	5 24	12	8½
Port Patrick -	11 10	15	12	Loch Tuadh (Go-	5 29	11½	8
Loch Ryan -	11 12	11	8	metra) I. of Mull }			
Mull of Cantyre -	10 35	4		Scarnish, Tiree I.	5 31	12	9
Campbellton -	11 45	8½	6	Arinagour, Coll I.	5 41	12½	9½
Lamlash -	11 49	10	7	Loch Moidart -	5 44	13½	9½
Ayr -	11 50	8½	7½	Eigg Island -	6 15	14	10
Troon -	11 50	10	7½	Arasaig -	5 50	13½	10
Ardrossan -	11 45	10	8	Loch Nevis -	5 47	14½	10
Garroch Head -	11 49	10		Loch Houra -	5 45	13½	10½
Millport, Great }	11 50	10	6	Ornsay, I. of Skye	5 50	14½	10½
Cumbræ - }				Kyle Rhea -	6 0	15	11
Largs -	11 50	10		Loch Duich -	6 0	15½	11
Greenock -	0 8	9½	8½	Loch Alsh (Kyle }	6 16	15½	11
Port Glasgow -	0 18	9		Akin) - }			
Dumbarton -	0 20	9		Loch Carron }	6 29	16½	11½
Bowling -	0 39	9		(Plockton) - }			
Renfrew (Canal Ent.)	1 15	9		Portree, I. of Skye	6 32	15	10½
Glasgow -	1 25	9	7½	South Rona, Light }	6 20	14½	10½
Loch Long -	12 6	12		House - }			
Loch Goil -	12 6	10	6	Loch Torridon -	6 20	15	11
Loch Strivan -	11 55	6		Barra, North Harb.	5 48	11½	8½
Burnt Isles, Kyles }	11 50	10	8	" Castle Bay -	5 44	11½	8½
of Bute - }				Canna Island -	6 19	14	9½
Skip Ness -	11 50	9	6	Loch Boisdale, }	5 47	12½	9½
Ardishaig, Loch }	11 53	9	7½	South Uist - }			
Fyne - }				Benbecula -	6 3	11½	8½
Laverary -	12 0	10		Loch Skipport -	5 52	12½	9
Gigta Sound -	2 22	4	2½	Loch Dunvegan }			
Port Ellen, Islay -	5 0	5	4	(Dunvegan Cas-	6 7	15½	11
Jura, Peolin Ferry	4 41	6½	4½	tle, I. of Skye) }			
" Small Isles -	5 3	3½	2½	Kallin, North Uist	5 59	13½	9½
Crianan -	4 49	6½	5	Monach Is. (Shillay)	5 44	12½	8½
Noamh Island -	5 2	11½	7	Loch Eport, N. Uist	6 6	12½	9½
Colonsay (Schal-	5 18	11	7½	Loch Maddy, N. Uist	6 6	12½	9½
lasaig) - }				Vallay -	6 10	11½	8½
Carraig -	5 28	10	7½	Berneray I. (Sound }	6 11	13	9½
Eisdale Sound -	5 10	10-12		of Harris) - }			
Ardintallan, Loch }	5 31	9	6½	Obb of Harris -	6 16	11½	8½
Feochan - }				East Loch Tarbert	6 10	13½	10
Oban -	5 22	12	9½	West Loch Tarbert	6 4	11½	8½
Stonefield, Loch Etive	7 3			Loch Seaforth }	6 16	15	10
Bunawe -	7 54	5½		(Athline) - }			
Port Appin, Loch }	5 26	12½	8½	Loch Clay " -	6 9	14½	9½
Linnhe - }				Loch Ewe (Poolewe)	6 39	14½	10½
Ballachulish, }	5 43	11		Loch Broom }	6 40	14½	10½
Loch Leven }				(Ullapool) - }			
" Head of Loch	6 28			Tenera, Summer I.	6 37	14	10½
Corran, Loch Aber	5 43	12	8½	Loch Inver -	6 40	14	11
Corpach -	5 59	11½		Loch Erisort, }	6 43	15½	11½
Loch Eil (Head of }	6 27			Lewis Id. - }			
Loch) - }				Stornoway " -	6 46	13½	9½
				Loch Roag (Ber-	6 11	11	8
				nera) Lewis I. - }			

				Place.	High Water, Full and Change.	Rise.		
						Springs.	Neaps.	
England, East Coast.								
					h. m.	ft.	ft.	
Loch Laxford	-	6 44	15	11½	Holy Island Harb.	2 30	15	11½
Cape Wrath	-	7 30	15½		North Sunderland	2 30	15	11½
Loch Eriboll	-	7 43	14½	11	Coquet Road	-	3 0	14½
Loch Tongue	-	7 53	15	12	Blyth	-	3 15	15
Thurso	-	8 28	14½	11	Tyne River (Bar)	3 20	14½	11½
Stroma, S. side	-	9 47	9	6½	" North Shields }	3 23	13½	10
Swona, E. side	-	10 24	10	7½	(Low Lt. Hse.) }			
" W. side	-	9 35	10	7	" Howden	-	12	
Great Skerry,	}	11 4	9½	6	" Walker	-	10½	
E. side					" Newcastle	-	4 23	10½
" W. side	-	10 53			Sunderland	-	3 22	14½
Orkneys.					Seaham	-	3 24	14½
Stromness	-	9 0	10	7½	Hartlepool	-	3 28	15
Westness	-	9 11	10	7½	Tees River, Bar	-	3 45	15
Kirkwall	-	10 9	10	7½	" Middlesbrough	-	3 55	13
Deer Sound	-	10 30	10	7½	" Stockton	-	4 40	11
Widewall	-	9 3	10	7½	Whitby	-	3 45	15
Otterswick	-	9 13	11	8	Scarborough	-	4 11	15½
Shetland Isles.					Filey Bay	-	4 20	16
Balta	-	9 45	6	4½	Flamborough Head	-	4 30	16
Lerwick	-	10 30	6	4	Bridlington	-	4 39	16
Hillswick, or Urie }	}	9 45	6½	5	Humber River, }	5 26	18½	15
Firth					Spurn Point			
Sealloway	-	9 30	5½	4½	" Grimsby	-	5 36	19½
Sumburgh Head	-	9 45			" Killingholme	-	6 2	19½
Fair Isle	-	11 0	5	3	" Hull	-	6 29	20½
Scotland, East Coast.					" Ferriby Sluice	-	6 41	20½
Duncansby Ness	-	10 14	10	7	" Blacktoft	-	6 59	16
Wick	-	11 22	10	7½	" oole	-	7 26	13
Dornock Road	-	11 47	11		Boston Deep, Clay }		21½	
Cromarty	-	11 56	11	11	Hole			
Inverness (Kellock Pier) }	}	12 18	11	9½	" Hob Hole	-	17	
Island					(Sluice)	-	7 0	12
Fraserburgh	-	0 28	10½	8	Lynn Deep, Long }	6 0	23	
Peterhead	-	0 40	11	8½	Sand			
Aberdeen	-	0 34	10½	8½	" Lynn Road	-	20	
Stonehaven	-	1 0	12	10	" Lynn	-	18	
Montrose	-	1 10	14	11	Wisbeach Eye	-	20	
Arbroath	-	1 25	13	10	Sutton Bridge	-	18	
Arbroath	-	1 35	14	11	Wisbeach	-	7 30	15
Tay River (Bar)	-	2 6	16	14	Wells Bar	-	6 20	18
Broughty Ferry	-	2 22	14½	11	Wells	-	7 0	12
Dundee	-	2 32	14½	11½	Blakeney Bar	-	6 30	15
Perth	-	3 35			Blakeney	-	9	
Cockenzie, Firth of }	}	2 16	15½	13	Cley	-	5½	
Forth					Cromer	-	7 0	14½	11
Leith	"	2 17	16½	12½	Leman Shoal	-	6 0	
Granton Pier	"	2 20	16	12½	Ower Shoal	-	6 30	
Burntisland	"	2 24	16½	12½	Hammond Knoll	-	7 40	
Queensferry	"	2 37	18	14	Winterton Ridge	-	7 50	
Kincaidine	"	2 53	17½	15	Yarmouth Road	-	9 15	6
Alloa	"	3 18	17½	15	" Haven, Brush	-	5½	4½
Stirling	-	3 52	7½	4½	" Bridge	-	5	4
Dunbar	-	2 8	14½	11	Lowestoft	-	9 57	6½
Eyemouth	-	3 15	15½	11½	Blyth River, South }	10 20	6½	4½
Berwick	-	2 18	15	11½	wold			
					Aldborough	-	10 45	8½
					Kentish Knock	-	11 47	6½
					Orfordness	-	11 15	8

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hollesley - -	11 30	8?	6?	Youghal - -	5 14	12 $\frac{3}{4}$	10
Orford Haven Bar	11 30	7 $\frac{1}{2}$		Ballinacourty, } Dungarvan - }	5 12	12 $\frac{1}{2}$	9 $\frac{1}{2}$
Orford Quay -	12 36	7 $\frac{1}{2}$		Dunmore - -	5 27	12 $\frac{1}{2}$	9 $\frac{3}{4}$
" Slaughden -	1 0	7 $\frac{1}{2}$		Waterford (Dun- } cannon Fort) - }	5 20	12 $\frac{1}{2}$	10
" Snape Bridge	3 0	6		----- (Bridge) -	6 6	13 $\frac{1}{2}$	10 $\frac{3}{4}$
Woodbridge or } Bawdsey } Haven Bar }	11 45	12	9	New Ross - -	6 4	12 $\frac{1}{2}$	10
" Kingston Quay	12 35	10		Saltees - -	5 40		
" Wilford Bridge	12 55	7		Wexford - -	7 21	5	3 $\frac{1}{2}$
Harwich Harbour	12 6	11 $\frac{1}{2}$	9 $\frac{3}{4}$	Kilmichael Point -	8 30	4 $\frac{1}{2}$	3
Orwell River, Pin- } mill - }	12 20	12		Arklow - -	8 45	4	3
" Downham } Reach - }	12 27	12		Wicklow - -	10 29	9	6 $\frac{1}{2}$
" River, } Ipswich - }	12 35	13 $\frac{1}{2}$		Bray Head - -	10 45	12	9 $\frac{1}{2}$
Stour River, } Wrabness - }	12 29	12		Dalkey Island -	10 45	13	11
" Mistley Quay	12 48	11 $\frac{3}{4}$		Kingstown - -	11 10	11	8 $\frac{3}{4}$
" Cattwade } Bridge - }	1 8	4 $\frac{1}{2}$		Dublin Bar (Pool- } beg Lt. House) }	11 12	12 - 14	9 - 11
The Naze - -	12 6	12 $\frac{1}{2}$	10	Howth Harbour -	11 9	13	10
Colne River, Colne } Point - }	12 0	14	10	Malahide Inlet -	11 15	10	8
" Wivenhoe - -	12 10	15	10 $\frac{1}{2}$	Rogerstown Inlet -	11 15	10 $\frac{1}{2}$	8
Blackwater River, } Scales Point - }	12 0	14 $\frac{1}{2}$	10	Skerries Islands -	11 0	13	10
" Heybridge - -	12 20	12	8	Balbriggan - -	10 40	11	
Chelmer River, } Maldon - }	12 32	10	6	Drogheda (Bar) -	11 0	11 $\frac{3}{4}$	9
Gunfleet Sand, N.E. } end - }	11 40	12	8	Dundalk - -	10 56	13 $\frac{1}{4}$	11 $\frac{1}{2}$
Crouch River, } Foulness - }	12 5	14 $\frac{1}{2}$	10 $\frac{1}{2}$	Greencastle Point	11 2	14	11 $\frac{1}{4}$
" Hull Bridge	12 25	16	11	Carlingford (Bar) or Cranfield Point.	11 0	14	11
Maplin Light - -	12 5	14 $\frac{1}{2}$	10 $\frac{1}{2}$	" Warrenpoint	11 10	14 $\frac{1}{2}$	12
Margate - -	11 40	15 $\frac{1}{2}$	13	Newcastle - -	11 4	14 $\frac{3}{4}$	12
Pansand Hole - -	12 0	15 $\frac{1}{2}$	13	Ardglass - -	11 0	16	12
Nore - -	12 30	15 $\frac{1}{2}$	13	South Rock - -	10 58	13	10 $\frac{1}{2}$
Sheerness - -	0 37	16	13 $\frac{1}{2}$	Lough Strangford } (Killard Point) }	10 53	14	11 $\frac{1}{2}$
Chatham - -	1 2	17 $\frac{1}{2}$	14	" Strangford } Quay - }	12 31	10 $\frac{1}{2}$	8 $\frac{3}{4}$
Gravesend - -	1 10	17 $\frac{1}{2}$	14	" Quoile Quay	12 45	11	9 $\frac{1}{4}$
Woolwich - -	1 37	18 $\frac{1}{2}$	15 $\frac{1}{2}$	" Kircubbin	12 42	11 $\frac{1}{2}$	9 $\frac{1}{2}$
Greenwich - -	1 43	19	15	" Killyleagh	12 40	11	9 $\frac{1}{4}$
London Docks - -	1 57	19 $\frac{1}{2}$	17	Head of the Lough } (Turley Rocks) }	12 44	11 $\frac{1}{2}$	9 $\frac{1}{2}$
London Bridge -	2 7	19 $\frac{1}{2}$	16 $\frac{3}{4}$				
<i>Ireland, South and East Coasts.</i>				<i>Ireland, West Coast.</i>			
Cape Clear - -	4 0	9	6 $\frac{1}{2}$	Cape Clear - -	4 0	9	6 $\frac{1}{2}$
Baltimore - -	4 23	10 $\frac{1}{4}$	8 $\frac{1}{2}$	Skull - -	4 2	9 $\frac{3}{4}$	7 $\frac{1}{2}$
Castletownsend -	4 21	10 $\frac{1}{2}$	8	Crookhaven - -	4 9	9 $\frac{1}{4}$	8
Clonakilty Bay -	4 30	11	8 $\frac{1}{2}$	Dunmanus Harbour	3 57	9 $\frac{1}{2}$	7 $\frac{1}{4}$
Courtmacsherry -	4 36	10 $\frac{3}{4}$	8 $\frac{1}{2}$	Dunbeacon - -	3 51	10 $\frac{1}{2}$	7 $\frac{1}{4}$
Kinsale - -	4 43	11 $\frac{1}{2}$	9	Black Ball Harbour	3 40	9 $\frac{1}{2}$	7 $\frac{1}{4}$
Queenstown - -	5 1	11 $\frac{3}{4}$	9	Castletown, Bear- } haven - }	4 14	9 $\frac{3}{4}$	7 $\frac{1}{2}$
Cork, (Penrose } Quay) - }	4 58	12 $\frac{3}{4}$	10	Bantry Harbour -	3 47	10	7 $\frac{1}{2}$
Ballycotton - -	4 54	12	9 $\frac{1}{2}$	Kenmare R., Bal- } lycrovane }	3 42	10 $\frac{1}{2}$	7 $\frac{3}{4}$
				" Dunkerron	3 45	10 $\frac{1}{2}$	8
				" Ormond - -	3 43	10	7 $\frac{1}{2}$
				" West Cove	3 52	10	7 $\frac{1}{4}$
				Ballinskellig Bay -	3 40	12	7 $\frac{1}{4}$

Westport - -	4 57	12½	9½	Ploumanach - -	5 15	24½	18½
Achillbeg - -	5 14	10½	8	Ploughrescan - -	5 17	25½	18½
Bulla Mouth, } (N. entrance of } Achill Sound) - }	5 38	10½	7½	Tréguier - -	5 32	25	18½
Blacksod Bay } (Quay) - - }	4 47	10	8½	Héaux Lights - -	5 45	31	23½
Broadhaven Harb.	5 0	10½	7½	Bréhat - -	5 51	31	23½
Killala Bay - -	5 22	10½	8	Paimpol - -	6 0	31	23½
Sligo Bay, (Mul- } laghmore) - - }	5 18	11½	8½	Portrieux - -	6 0	31	23½
Ballysadare (Quay)	6 0	8½	5½	Binnic - -	6 3	30	22½
Sligo Harbour } (Oyster Island) }	5 23	11½	8½	Dahouet - -	6 5	32	23½
Ballyshannon (Bar)	5 18	11½	8½	Erqui - -	5 59	33½	24½
Donegal Harbour } (Salthill Quay) }	5 18	11½	8½	St. Malo - -	6 5	35	26
Teelin Harbour - -	5 16	11½	8½	Les Minquiers - -	6 6	35	26
Killybegs - -	5 16	11½	8½	Cancalle - -	6 20	37	27
Lough Rossmore - -	5 20	11	8	Iles de Chansey - -	6 9	35	26
Rutland Island - -	5 22	11	8	Granville - -	6 13	37	27½
Gweedore (Bunbeg)	5 32	11	8	Régneville - -	6 20	35	26
<i>Ireland, North and East Coasts.</i>				St. Germain - -	6 20	34	25
Ballyness (Bar) - -	5 22	11½	8½	Carteret - -	6 25	31	22½
Sheephaven - -	5 32	11½	8½	Ecrehous - -	6 32	31	22½
Mulroy Bay, (Bar)	5 40	11½	8½	Jersey, Rosel - -	6 15	30	21½
" Fanny Hole - -	6 17	9½	8	" St. Helier - -	6 36	31½	23
" Seamount Bay	6 44	7½	2½	Diélette - -	6 40	27	20½
" Cranford Bay	8 3	4	2½	Goury - -	7 6	22	17½
Rathmullan, Lough } Swilly - - }	5 42	12½	9	Omonville - -	7 29	15½	12½
				Guernsey (St. } Peter Port) - }	6 37	26	18½
				Casquets - -	6 45	15½	
				Alderney - -	6 46	17½	12½
				Cherbourg - -	7 49	17	12½
				Barfleur - -	8 51	17	13½
				La Hongue - -	8 42	18½	14½
				St. Marcouf Is. - -	9 55	20	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port-en-Bessin -	8 57	20	15½	Elbe, Hamburg -	5 29	6½	
Coursenilles -	9 7	20	15½	Eider, Tønning -	2 1	9	
Oystreham -	9 38	21	16	" Friederich- } stadt - }	2 37	9	
Merville -	9 36	21	17¼	Eider, Rendsborg -	7 42	4	
Dives -	9 39	21	16	Husum -	2 36	9	
Honfleur -	9 29	23½	18	List -	2 21	6	
Quillebœuf -	10 6	9½	7½	Hierling -	2 45	5	
Caen -	10 57			Nyminde Gab -	2 41	2	
Hâvre -	9 51	22	18	Thorsminde -	3 34	2	
Rouen -	2 28			Blaavand or Horn } Point - }	1 44	5	
Fécamp -	10 44	23½	18	Aggerminde -	4 9	2	
St. Valery-en-Caux	10 46	27	21¼	Hirtshals -	4 28	1	
Dieppe -	11 6	27	20½	Skagen or the Skaw	5 56	1	
Tréport -	11 9	27	21	Bergen -	1 30	4	
Cayeux -	11 5	27½	21	Romdals Islands -	10 45	6	
Hourdel -	11 26	27½	21	Ramso Fiord -	10 45	7	
St. Valery-sur- } Somme. }	11 46	27	21¼	Oxbaasheia, Svec } Fiord - }	12 0	8	
Boulogne -	11 25	25	19½	Trø Islands -	11 45	7	
Cape Grisnez -	11 27	21½	16½	Værø -	12 0	9	7½
Calais -	11 49	19½	15½	Lofoten Islands -	12 0	9	7½
Gravelines -	12 0	19	15	Tromsø -	1 45	8	
Dunkerque -	12 8	16½	13½	Hammerfest -	1 10	9	
<i>North Sea, East Coast.</i>				<i>Færoe Islands.</i>			
Nieuport -	12 18	16	13	Fugloe Fiord -	11 15	6½	4½
Ostend -	12 25	19	15	Svinoe Fiord -	12 0	6½	4½
Blankenberg -	12 48	13	11	Leervig Fiord -	0 30	6½	4½
Bathz -	3 15	15		Miaveness -	3 12	6½	4½
Flushing -	1 20	15		Naalsole Fiord -	4 0	6½	4½
Antwerp -	4 25	15		Skaapen-Fiord(between Stormoe } and Sandoe) - }	5 0	9½	7½
Veere -	1 20	15		" (between Hestoe } and Sandoe) - }	5 30	9½	7½
De Roompot -	12 30	12	8	Waagoe Fiord -	6 0	9½	7½
Zieriksee -	2 0	11	9	Westmanshaven -	8 0	9½	7½
Brouwershaven -	2 15	10	8	Suderoe Fiord -	6 0	9½	7½
Goeree (West Gat)	1 45	7		Myggenæs Fiord -	9 0	9½	7½
Hellevoetsluis -	2 30	8	6	Eides Fiord -	11 0	9½	7½
Brielle -	3 0	5		<i>Iceland.</i>			
Rotterdam -	3 45	7		Reikiavik -	5 0	17½	13½
Katwyk -	2 30	5		<i>Lapland.</i>			
Texel (outside shoals)	6 30	4	3½	Liza Bay -	5 58	9	
Kykduin -	7 0	12		Nova Zembla Harb.	6 36	10	
Nieuwediep -	7 27	4	3½	Jekatarina Islands	6 23	10	
Terschelling(West)	8 40	6	5	Kildin Island -	6 45	12	
Ameland Gat -	9 0	7		Habitable Island, } Seleney Bay - }	7 9	9	
" Hollum Rd.	11 30	7		Teriberka River -	7 20	12	
Ems (outer buoy)-	10 0	8-10		Olenji Islands -	7 30	12	
Borkum (road) -	10 30	8-10		Charlowka River -	8 8	12	
Delftzyll -	11 15	8-10		Seven Islands -	8 20	12	
Emden -	12 0			Jukan Islands -	9 0	13	
Norderney -	10 30	8		Sviatoi Nos -	9 15	14	
Weser, outer light } vessel - }	11 30						
Wanger Oog -	12 0	9?					
Helgoland -	11 33	9½	7				
Elbe, entrance -	12 0	11					
" Cuxhaven -	1 8	10					
" Brunsbüttel -	1 58	9					
" Glückstadt -	3 9	10					
" Altona -	5 19	7					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
White Sea.					h. m.	ft.	ft.
Inkanskie -	9 15	14	ft.	Walvisch Bay -	1 54	6	
Turna Bay -	9 54	11		Port Alexander -	3 0	5	
Trek Island -	10 48	20		Great Fish Bay -	2 30	5 - 6?	
Litke Bank -	11 45	15		Little Fish Bay -	2 30		
Cape Kanushin -	11 54	15		Lobito Bay -	2 20	5	
Sosnovets -	11 44	18		Benguela -	2 30	5?	
Morjovets I. -	11 20	17		St. Helena Island -	3 11	3	
Cape Voronov -	11 20	17		Ascension Island -	5 30	2	
Intsi Point -	11 55	16		San Paul de Loanda -	4 30	5	
Kouloi River -	1 15	20		River Congo -	4 30	6	
Mezen -	1 48	15 - 22		Mayumba -		7	
Kerets Point, Gulf } of Arkhangel - }	4 30	5½		River Gaboon -	5 30	3	
Nikolskoi Tower „	6 0	2		Cape Lopez -	4 30	4 - 6?	
Moudiuga I. „	5 50	3½		Corisco Bay } (Elobey Isles) - }	5 0	7	
Dvina Bar -		3½		Anno Bom Id. -	3 45	5	
Arkhangel „	7 28	2½		St. Thomas Id. -	3 25	4½	
Nikolskoi Chan. „	5 25	3		Princes Id. -	3 45	4½	
Gribanika Pt. „	4 50	3		Fernando Po -	4 0	7	
Jijginsk I. -	5 15	4		Cameroon River -	4 0?	6	
Cape Orlov Letni, } Gulf of Onega - }	5 18	4		Bonny and New } Calabar Rivers - }	5 0	9	
Onega River -	9 17	6 - 7		Brass River -	4 0	6	
Souma -	6 30	5½		River Niger, Nun } (entrance) - }	4 8	6	
Solovet Road -	5 0	4		„ Middleton -	4 15	5	
Kyem River -	5 23	4		„ Pennington -	4 15	5	
Kalgalakska -	6 50	7		„ Dodo -	4 17	5	
Keret, Gulf of } Kandalak - }	3 8	6		„ Ramos -	4 20	5	
Kovda Bay -	3 25	6		„ Forçados -	4 22	5	
Kandalaksha „	3 25	7		„ Benin -	4 30	7	
Sosnovaia Bay „	2 40	6		„ Lagos (Bar) -	6 0	3	
Kou Zomen -	3 30	6		„ „ Consulate } Wharf }		2	
Tetrina -	3 17	7		„ Palaver Ids. -		1	
Nova Zembla.				Cape Coast Castle -	4 30	6	
Hakluyt Head -	1 30	4		St. George d'Elmina -	4 30	6	
Spitzbergen.				Cape Three Points -	4 0	4	
Bell Sound -	8 56	3½		Axim -	4 30	4	
Danes Id., South } Gat - }	0 24	5½		Grand Lahou -	4 20	4	
Africa, West Coast.				Tabou River -	4 45	3 - 4	
(From Cape of Good Hope to the Northward.)				Cape Palmas -	4 30	4	
Simons Bay -	2 44	5½	3½	Sinou -	5 0	4	
Hout Bay -	2 20	5		Sangwin River -	5 15	4	
Table Bay -	2 40	5		Grand Cestos -	5 20	4	
Saldanha Bay -	2 0	6		Edina -	5 50	4	
St. Helena Bay -	2 30			Junk River -	5 45	5	
Roodewall Bay -	2 30	6½		Monrovia -	6 0	6	
Hondenklip Bay -	2 30	5½		Gallinas River -	6 45	4	
Mc. Dougall Harb. -	2 30	5¾		Gilmorris Id. }	6 0	11	
Port Nolloth -	2 30	5¾		Sherbro River - }			
Elizabeth Bay -		5 - 6		Edmonstone Id. „		8	
Angra Pequena -	2 30	8		Bagroo River „		11	
Ichabo Island -	1 0	6	4	Banana Islands -	8 15	9	
Spencer Bay -	10 50	5 - 6		Sierra Leone -	7 55	8	
Port d' Ilheo -	3 0	8 - 10		Yellaboi Island -	7 10	10	
				Scarcies Rivers -	7 10	10	
				Mellacoree R. -	7 40	11	
				Forecarreah R. -	7 40	11	
				Mahneah R. -	7 40	11	
				Isles de Los -	6 35	13	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
River Ponga -	7 30	12	9½	Mondego (Bar) -	2 30	7	
" Nunez -	10 0	15	11½	Oporto -	2 30	10	
" Componee -	10 0	15	11½	Fayal, Azores -	11 45	4	
Bijonga Ids., Or- ango Channel -	10 0	11		Terceira " -	12 32	4½	
" Arcas } Channel -	10 10	11 - 14	9	St. Michael " -	12 30	6	
" Bissao- River Cacheo -	11 0	8		Funchal Bay, Ma- deira -	12 48	7	
" Gambia -	8 10	6 - 9		Vigo -	3 0	12 - 13	
Joombas River -	8 10	6		Cape Finisterre -	3 0		
Salm River -	8 10	6		Port Camariñas -	3 0	15	
Goree -	7 45	2½		Corunna -	3 0	15	
Senegal (Bar) -	8 42	6		Ferrol -	3 0	15	
----- (Guet } N'dar) -	8 42	6		Cedeira -	3 0	15	
----- (St. Louis) }	10 0	6		Vivero -	3 0	15	
Sal, C. Verde Ids.	7 45	5		Rivadeo -	3 0	15	
Porto Praya " -	6 0?	5		Barquero (entrance)	3 0	15	
Portendik -	10 0	6		Gijon Bay -	3 0	14	11
Levrier Bay -	12 0	6 - 7		St. Martin de la } Arena -	3 30	15	
Ouro River -	12 0	8 - 9		Santander -	3 30	15	12
Cape Blanco -	11 46	6		Santona -	3 30	12½	10½
Cape Bojador -	12 0	8?		Bilbao (Bar) -	3 0	13	
Cape Juby -		8		Olaveaga -	3 15	12	
Ferro, Canary Ids.	12 30?	9?		Bilbao (Town) -	3 20	9	
Palma " -	12 30?	9?		St. Sebastian -	3 0	12	9
Gomera " -	12 45?	9?		Port Pasages -	3 0	12	9
Lanzarote " -	1 0?	9?		Socoa -	3 19	12½	8
Santa Cruz, Tenerife	1 30	8	6	Bayonne (Bar) -	3 45	12	10½
Puerto de la Luz, } Gran Canaria -	12 52	10		Boucaut, Adour R.	3 39	8½	6
Santa Cruz or } Agadir -	12 45	9		Arcachon -	4 37	11½	9½
Mogador -	1 18	10 - 12		Cordouan Lt. house	3 37	13½	10½
Cape Cantin -	10 0	10		Royan -	3 38	13½	10
Rabat -	1 46	9 - 12		St. Surin -	4 11	14½	11
El Araish -	1 30	9 - 12		Bordeaux -	6 50	14	12½
Tangier -	1 42	8		Iled'Aix, Charente } R. Entrance -	3 20	17	12½
Ceuta -	2 6	3½	2½	Ile d'Oleron -	3 50	19	
Tetnan -	2 23	2½	1½	Rocheport -	4 6	17	13
Tunis (Goletta) -		3		Rochelle -	3 31	17	13
Jerba -	3 10	7	5	Les Sables d'Olonne	3 26	14	10
				Seudre River (en- trance, -	3 31	15	11½
				Ile d'Yeu -	3 6	14½	10
				Ile de Noirmontier	3 2	16	11½
				Port Navallo -	3 42	13	9½
				St. Nazaire -	3 10	15½	11
				Port le Palais, } Belle Ile -	3 18	14½	10½
				Port Louis, L'Orient	3 11	13	9½
				Concarneau -	3 12	13	9½
				Penmark Rocks -	3 16		
				Glenan Is. -	3 12	13	10
				Ile de Sein -	3 21	17½	12
				Brest -	3 47	19	13½
				Conquet Road -	3 46	21	15
				Ushant -	3 32	19½	13½
<i>Europe, West Coast.</i>				<i>South America, East Coast. (Cape Horn to the Northward.)</i>			
Malaga -	12 0	3		St. Martin Cove, }	3 50	8	
Gibraltar, old Mole	2 20	3½		Cape Horn Ids. }			
Algeciras -	1 49	4	2½				
Tarifa -	1 46	6	3½				
Cadix -	1 45	9½					
Rota -	1 24	12½	8				
Salmedina Rocks -	1 27	12½	8				
Chipiona -	1 34	12½	8				
San Lucar -	1 53	12½	8				
Bonanza -	2 0	12½	8				
Conil -	1 18	11½	7½				
Lagos -	2 7	13					
Setubal -	2 30	8					
Lisbon (Belem) -	2 30	12	9				
Peniche -	1 54						

Cape Pefias	6 42	12		*RiodelaPlata, (C. } Castillos) }	8 30	2	
Cape San Diego	4 30	10		" Buenos Ayres	12 0	3-5	
Orange Bay	3 30	6		" Barragan Bay	7 0	5-9	
Goree Road	4 0	8		Rio Grande do Sul		1½-2	
Le Maire Strait	4 0	7		Santa Catharina I.	2 45	6	4½
Staten Island	4 30	8		San Sebastian	2 0	4	
San Sebastian Bay	7 0			Ilha Grande (Es- trella Bay) }	12 30	5	1
<i>Falkland Islands, East Falkland.</i>				Rio Janeiro	3 0	4	3
Berkeley Sound	5 0	7	5½	Porto Frio	2 40	4½	
Port William	5 15	7		Macahé	2 30	9½	
Port FitzRoy	4 45	6		Benevente	3 0	5	
Port Pleasant	5 0	6½		Espirito Santa			
Island Harbour, } Choiseul Sound }	5 20	6		Bay, and Port	3 0	4	
Mare Harbour	6 0	6		Victoria			
Darwin Harbour	6 30	5½		Abrolhos	3 20	6-7	
Walker Creek	6 20	5½		Martin Vas Rocks	3 45		
Low Bay	5 0	5½		Os Ilheos	4 30		
Adventure Sound	5 30	5½		Bahia	4 15	8	
Bay of Harbours	6 0	■		Maceio	4 30	8½	
Falkland Sound N. }	6 45			Pernambuco	4 45	8	6
entrance }				Parahiba	5 0	9-12	
" S. entrance	7 0			Cape St. Roque		8-10	
Ruggles Bay	7 30	5		Rocas	5 15	10	
Port King	7 30	5		Fernando Noronha	4 0	6	
" Sussex	8 15	6		Aracati	6 0	8	6
" San Salvador	8 10	8		Ceara	4 30	9	
" San Carlos	7 0	8		Jericoacoara	11 30	11	9
<i>West Falkland.</i>				Maranhão	7 0	16½	10½
Port Stephens	7 45	7½		San Joao	6 24	14	
" Albemarle	7 15	7		Para	12 0	11	10½
" Edgar	7 15	6		Cayenne River	3 45	6-11	
Fox Bay	7 0	6		Maroni River	5 30	8	
Manybranch Harb.	7 40	7½		Surinam	6 0	5½	
Port Egmont	7 30	11		Corentyn River	5 10	8½	6
Hope Harbour	8 10	■		Berbice	4 30	11½	6
Shallow Harbour	9 30	6		Demerara River	4 45	9	6
Ship Harbour, New }	10 30			Orinoco R. (entr.)	6 0	3	
Island				Chacachacare Id. }	3 30	4	
<i>South America, East Coast—continued.</i>				Trinidad }			
Port Gallegos	8 50	46		Dragons Mouth "	3 0	4	
Coy Inlet	9 30	40		Port Spain "	4 30	4	3
Santa Cruz River	9 30	40	29	Tobago	irr.	■½	
Port San Julian	10 45	30		Cartagena	11 0	1½	1
" Desire	12 10	18½		Caledonia Harbour	11 40	1½	1
" Melo	3 40	15		<i>Caribbean Sea and the Bahamas.</i>			
" Santa Elena	4 0	17		St. Vincent }	3 0	1½	1
Nuevo Gulf	7 0	10		(Kingstown) }			
Port San Josef	10 0	■	25	Grenada, (St. }	2 40	1½	■
Sea Bear Bay	12 45	20		George Harb.) }			
Port San Antonio	10 40	28		Grenadines	3 0	1½	1
Rio Negro	11 0	14		Barbados	irr.	2	
San Blas	2 0	■	10	Martinique (Robert		4-5	
Colorado River	4 0	9	7½	Harbour) }			
Union Bay	8 10	12	9	English Harbour, }		2	
Port Belgrano	6 0	12	■	Antigua			
Tristan d'Akunha		8		Anegada	9 0	1½	
				Gorda Sound, }	8 30	1½	
				Virgin Island - }			

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
Tortola -	8 30	1½		<i>Bermudas.</i>			
Culebra or Passage Island -	9 0	1		Ireland Id. Dock } h. m.	ft.	ft.	
Christiansted, Santa Cruz -	7 30	¾		Yard - - - } 7 14	4		
San Juan, Porto Rico -	8 2	1½		<i>North America, East Coast. (Isthmus of Panama to the Northward.)</i>			
Saintes -	6 45			Greytown -	9 0	1½	
Inagua -	8 0	3½	2½	Blewfields -	1 50	2	
Mira-por-vos -	9 30	3	2½	Corn Islands -	1 45	2	
Turks Islands -		3		Colombilla Cay, } 2 0	2		
Stirrup Cays -	7 0	4		Pearl Cays -			
Crooked Island -	7 0	2½		Cape Gracias Harb. } 10 30	2		
Exuma -	7 20	2½		Royal Harbour, } 7 45	3½		
Royal Island -	7 45	3½		Ruatan -			
Clarence Harbour, } 8 30		4	3½	Serranilla Bank -	irr.	2	
Long Island -				Serrana Bank -		2	
Rugged Island -	8 0	3		Old Providence -	irr.	1	
Mucaras Reef -	7 40	3		Bonacca Island -	9 0	1½	
Lobos Cay -	7 40	3		Mugeres Harbour -	9 30	1½	
Guinchos Kay -	7 40	3		Cozumel -	8 30	1½	
Nassau, New Providence -	7 30	4	3	Cape Catoche -	9 30	1½	
S. W. Bay -	7 30	4		Campeche -	1 45	2½	2
Salt Cay Anchorage -	8 15	4	3	Sisal -		2	
Hanover Sound -	8 15	4	3	Laguna de Terminos -	noon	1½	
Douglas Road -	8 30	4	2½	Triangles -		1½	
Abaco -	8 0	3		Arcas Rocks -	noon	1½	
Man-of-War Cay -	8 10	4		Vera Cruz -		2	
Gun Cay -	8 30	3		<i>United States.</i>			
Memory Rock -	7 50	3		<i>(Texas, Louisiana, Mississippi, Florida, Georgia, and S. & N. Carolina.)</i>			
Bluff Cay -	7 0	4½		Brazos R. (entr.)†	irr.	1½	
Puerto de la Plata, } 7 30		3?		St. Luis Pass, Texas†		1½	¾
St. Domingo -				Galveston -		1½	¾
Mancenille Bay -	7 0	4 - 5?		Sabine Pass†		1½	
Fort Dauphin -	7 0	5½	3½	Calcasieu River†		2½	1½
Cape Haiti, St. } 6 0		3		Vermilion Bay } irr.	2½	1½	
Domingo -				(entrance)† -			
Lacul Harb. -	6 0?	3?		Atchafalaya Bay†	irr.	2 - 2½	
Gonaives Bay -	8 0?	1?		Timballier Bay†	irr.	2	
Bay of St. Mark -	8 0?	1?		Barataria Bay } irr.	1½		
Port au Prince -	8 0?	1?		entrance)† -			
Caimites -	8 0?	1?		Mississippi S.W. pass		1½	¾
Bay of Aux Cayes -	uncertain	2 - 3?		Biloxi†	irr.	2	
Fiamand Bay -	"	2 - 3?		Mobile -	irr.	1 - 2	
St. Louis Bay -	"	2 - 3?		Pensacola -		1½	
Aquin Bay -	"	2 - 3?		St. Andrews Bay†	irr.	1 - 2	
Jacmel -	"	2 - 3?		St. Georges Sound } irr.	2½ - 4		
Havana, Cuba* -	8 14	3		(west entrance)†			
Roca de Varadero,*	8 39	2					
Baracoa -	7 23	2½		(middle entr.)†	1 31	1½	1½
Puerto de Mata,*	6 49	2½		Apalachicola Bay -		2½ - 4	
Santiago de Cuba,*	8 33	2½		St. Marks†	1 14	3	2½
Playa de Incia,*	7 31	2½		Cedar Cays†	0 51	3½	2½
Puerto de Baiti-queri,*	9 7	2½		Tampa Bay†	11 21	1½	1½
Puerto de Maravi,*	7 56	2½		Tortugas†	9 56	1½	1
Puerto de Taco,*	8 49	2½		Cay West†	9 30	1½	1½
Cape St. Antonio,*		1½		Cay West, N.W. } 9 10	1½	1½	
Port Royal, Jamaica	11 0	1		Channel† -			

* From the Anuario de la Direccion de Hidrografia, Madrid, 1863.

From the United States Coast Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water Full and Change.	Rise.		Place.	High Water Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
(New Jersey.)							
Sand Cay* -	8 40	2	1	Cape May Landing*	8 19	6	5
Indian Cay* -	8 23	2½	1½	Cold Spring Inlet*	7 32	5½	4½
Cape Florida* -	8 34	1½	1½	Little Egg Harbour	7 10	4½	3½
St. Augustine* -	8 21	5	4				
St. Johns River* -	7 28	5½	5	(Long Island Sound.)			
Fort Clinch, Fernandina* -	7 53	6½	6½	Watch Hill* -	9 0	3	2½
St. Simons Island*	7 43	8½	6½	Stonington* -	9 7	3½	3
Doboy Lighthouse*	7 33	7½	7	Little Gull Island*	9 38	3	2½
Savannah (City)* -	8 13	7½	6½	New London* -	9 28	3	2½
Fort Pulaski, Savannah (entr.)* -	7 20	8	7	New Haven* -	11 16	6½	5½
Hilton Head* -	7 19	7¼	6½	Bridgeport* -	11 11	8	6½
St. Helena Sound*	7 8	7½	6	Sheffield Island* -	10 58	8½	7½
North Edisto R.* -	7 10	7	5½	Oyster Bay* -	11 7	9½	8
Charleston* -	7 26	6	5	Sands Point*	11 13	9	7½
Bulls Island Bay -	7 16	5½	4½	New Rochelle* -	11 22	8½	7½
Georgetown* -	8 40	4½	3½	Throgs Point* -	11 20	9½	7½
South Island* -	7 56	4½	3½				
Wilmington* -	9 6	3	2½	(New York to Portland.)			
Cape Fear River (Smithville)* -	7 19	5½	4½	Tarrytown* -	9 57	4	3½
Bald Head* -	7 26	5	4½	New York* -	8 13	5½	4½
Beaufort* -	7 26	3½	2½	Sandy Hook* -	7 29	5½	5
Ocracoke Inlet* -	7 4	2½	2	Hell Gate Approaches* :			
Hatteras Inlet* -	7 4	2½	2	— Long Island (Blackwells Dk.)* }	9 59	6	5½
(Chesapeake Bay and Rivers.)				— — N. of Astoria Ferry* - }	9 48	6½	5½
Cape Henry -	7 40	4		— — Pot Cove, (S.E. part)* - }	10 48	8½	6½
Cape Charles -	7 45	5		— Wards Island (Paupers Dock)* }	10 9	6½	5
Old Point Comfort*	8 17	3	2½	Montauk Point* -	8 20	2½	2
James R., City Point*	2 11	3	2½	Block Island* -	7 36	3½	2½
Richmond* -	4 28	3½	2½	Point Judith* -	7 32	3½	3½
York R. (Moody's Wharf) -	9 35	3½		Newport* -	7 45	4½	4
Piankatank River (Cherry Point) -	10 5	2	¾	New Bedford, entrance* - }	7 57	4½	4
Tappahannock* -	0 42	2	1½	Bird Island Light*	7 59	5½	4½
Rappahannock (Saunders Wharf) }	3 2	2½	2	Kettle Cove* -	7 48	5	4½
Point Lookout* -	12 58	2	1½	Cuttyhunk* -	7 40	4½	3½
Annapolis* -	4 38	1	1	Quicks Hole (S. Side)* }	7 36	3½	3
Chester R. (Rockhall Creek)* -	5 23	2½	1	" (N. Side)* }	7 31	4½	3½
Patapsco River (Bodkin Point)* }	5 42	1½	1	Menemsha Bight*	7 45	4	2½
Baltimore* -	6 33	1½	1½	Woods Hole (entr. from Vineyard Sound)* - }	8 34	2	1½
(Delaware Bay and River.)				— (entrance from Buzzard Bay)* }	7 59	4½	4
Cape Henlopen -	8 0	4½		Tarpaulin Cove* -	8 4	2½	2½
Delaware Breakwater* -	8 0	4½	3½	Gay Head -	7 37	7	
Higbees, Cape May*	8 33	6½	5½	Holmes Hole* -	11 43	1½	1½
Egg Island Light*	9 4	7	5½	Edgartown* -	12 16	2½	2
Mahons River* -	9 52	7	5½	Hyannis* -	12 22	4	3
New Castle* -	11 53	7	6½	Nantucket* -	12 24	3½	3
Philadelphia* -	1 18	6½	5½	St. George Shoals	10 30	7	
				Monomoy* -	11 58	5½	4

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Provincetown* -	11 22	10 $\frac{3}{4}$	9 $\frac{1}{2}$	Lepreau -	11 18	24 $\frac{1}{2}$	21
Wellfleet* -	11 5	13 $\frac{1}{2}$	12	L'Etang Harbour -	11 19	23 $\frac{1}{2}$	20
Cape Cod -	11 30	13		Campobello	11 21	23 $\frac{1}{2}$	20
Barnstable -	11 22	10	8 $\frac{1}{2}$	(Welchpool) -			
Plymouth* -	11 19	11 $\frac{1}{2}$	10 $\frac{1}{2}$	St. John Harbour	11 21	27	23
Boston Light* -	11 12	11	9 $\frac{1}{2}$	Quaco -	11 35	30	25
Boston (Charles- town Naval Yd.)* }	11 27	11 $\frac{1}{2}$	10	Spicers Cove (near Cape Chignecto) }	11 35	37	30 $\frac{1}{2}$
Marblehead -	11 30	12		Grindstone Island -	11 47	41	34 $\frac{1}{2}$
Salem* -	11 13	10 $\frac{1}{2}$	8	Folly Point }	11 49	45	38
Gloucester Harbour* -	11 4	10 $\frac{3}{4}$	8 $\frac{3}{4}$	(mouth of Petit- coudiac River -			
Rockport* -	10 57	10 $\frac{1}{2}$	8	Cumberland Basin, }	11 55	45 $\frac{1}{2}$	38
Annisquam* -	11 0	10 $\frac{3}{4}$	9	(Sackville -			
Ipswich* -	11 26	10 $\frac{1}{2}$	8 $\frac{1}{2}$	Monckton (Railway)	12 15	47	37 $\frac{1}{2}$
Newburyport* -	11 22	9	7 $\frac{1}{2}$				
Portsmouth* -	11 23	10	8 $\frac{1}{2}$				
Portland* -	11 25	10	8 $\frac{1}{2}$				
Kennebec River }							
(Hanniwells	11 15	9 $\frac{1}{2}$	8				
Point)* -							
Mount Desert Id. -	11 10	13					
<i>Bay of Fundy, Nova Scotia.</i>							
Cape Sable, Bar- rington Bay, }	8 27	8 $\frac{1}{2}$	6 $\frac{1}{2}$				
(Clam Point) -							
Cape Sable, Clarkes	8 58	11	9				
Harbour -							
Pubnico -	9 25	12	10				
Argyle, (Jones	9 27	12 $\frac{3}{4}$	10 $\frac{1}{2}$				
Anchorage) -							
Seal Island (Cape	9 49	12 $\frac{3}{4}$	10 $\frac{1}{2}$				
Sable) -							
Ellenwoods An- chorage -	9 54	13	10 $\frac{1}{2}$				
Jehogue -	10 4	15	11 $\frac{1}{2}$				
Yarmouth -	10 9	16	13				
Sandy Cove E., }	10 33	21 $\frac{1}{2}$	17 $\frac{1}{2}$				
St. Marys Bay }							
Petit Passage -	10 41	22	18				
Grand Passage -	10 43	20 $\frac{3}{4}$	17				
Sandy Cove, West	10 47	23	19				
Nigby Gut -	11 0	27 $\frac{1}{2}$	23				
Port George -	11 17	32	28				
Isle Haute -	11 21	33	28 $\frac{1}{2}$				
Black Rock -	11 29	36	31				
Spensers Anchorage	11 42	39	33				
Parbboro, Basin }	12 17	43	37 $\frac{1}{2}$				
of Mines }							
Horton Bluff, -	12 30	48	40				
Noel -	12 41	50 $\frac{1}{2}$	43 $\frac{1}{2}$				
<i>Bay of Fundy, New Brunswick.</i>							
Seal Cove, Grand }	10 54	20	15				
Manan -							
Machias, Seal Id.	11 5	18	14 $\frac{3}{4}$				
Grand Harbour, }	11 7	21	17 $\frac{1}{2}$				
Grand Manan -							
West Quoddy -	11 12	21	17				
Fish Head, Grand }	11 16	22 $\frac{1}{2}$	18 $\frac{1}{2}$				
Manan -							

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		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	
Pictou Harbour -	10 0	6	4	Bonne Esperance } Harb. - - }	9 15	5	2½
Caribou Harbour -	10 0	6	4	Mistanoque -	10 30	6	3
Amet Sound -	10 30	8	5	Antrobus Island -	10 30	5	3
Tatamagouche -	10 0	8	5	Wapitagn Harbour	10 30	5	3
Wallace Harbour -	10 30	8	5	Coacocho Bay -	10 30	5	3
Pugwash Harbour	10 30	7	4	Kegashka Bay -	10 45	5	3
Bay Verte -	10 0	9	5	Little Natashquan -	11 0	5	3
<i>New Brunswick.</i>				Appetetat Bay -	11 10	5?	3?
Jourimain Island -	9 30	6	3	Betcheween Har- } bour - - }	11 32	5	3
Shediac Harbour -	{ 1 0 } 8 0	4	2	Clearwater Point -	11 30	5	3
<i>Prince Edward Island.</i>				Mingan Harbour -	1 16	6	4
East Point -	8 30	3½	2	Mingan Island -	1 30	6	4
Cardigan Bay -	8 40	5	3½	Bay of Seven Is- } lands - - }	1 40	9	5
Cape Bear -	9 0	6	3	Anticosti Island } (East Cape) - }	1 0	5	3
Charlottetown -	10 45	9½	7	" Bear Bay -	1 10	5	3
Crapaud -	10 0	8	6	" West Point -	2 0	6	4
Bedeque Harbour -	10 15	7	5	Cawee Islands -	1 50	9	5
Minimegash -	3 30	5	3	Egg Island -	2 0	11	6
Egmont Bay -	3 0	4	2	Point de Monts -	12 0	12	6
Cascumpeque Hr. -	5 40	3	2	Cape Chatte -	12 0	13	8
Richmond Harb. -	6 0	3	2	Godbout River -	1 52	11	6
Cape Turner -	6 10	4	2	St. Nicholas Harb.	1 55	12	7
Grand Rustico -	6 40	4	2	Manicouagon River	2 15	12	7
Tracadie -	7 0	3½	2	Bersimis River -	2 0	12	7
St. Peter Harbour	8 30	4	2½	Bic Island -	2 15	14	8½
Boughton Harb. -	8 40	5	2½	Port Neuf -	2 10	13	8
<i>Cape Breton Island.</i>				Matan River -	2 15	11	7
Port Hood -	9 0	4½	2	Little Metis -	2 10	13	8
Gut of Canso } (Plaister Cove) }	9 15	4	2	Saguenay, Tadousac	2 45	17	10
Mabou River -	9 0	4		" Chicoutimi	4 11	12	8
Chetican -	8 15	3½		<i>River St. Lawrence.</i>			
Cape North -	8 0	4		Magdalen River -	11 0		
St. Anne Bay -	8 34	6	4½	Mount Louis Bay	11 0	6-8	4
Sydney Harbour -	8 15	5	4	Green Island -	2 45	16	9½
Menadou Bay -	8 15	5½		Brandy Pots -	3 0	17	10
Louisburg Harb. -	8 0	5	4	Coudres Island } (Prairie Bay) - }	4 25	17	10
St. Peter Bay -	7 30	6	4	Pillars -	5 0	17	10
Habitants Harbour	8 20	6½	4½	Crane Island, } Middle Traverse }	5 24	17	13
Arichat -	8 10	5	4	Orleans Island, } North Traverse }	5 40	17	13
Bear Head -	8 30	4½	3	Quebec -	6 38	18	13
Poulament Bay, } Madame Island - }	7 50	6	4	Carouge River -	7 15	16	11
Grande-digue, ,, -	7 55	6½	4½	Frechette Island -	8 0	14	9
<i>Labrador and Gulf St. Lawrence.</i>				Port Neuf -	8 30	14	9
Eclipse Harbour, } Antezavick } Sound - }		5		Grondine -	9 0	9	6
St. Lewis Cape -	6 30			Cape Roche -	9 30	6	4
Fall Harbour } (Telegraph Pt.) }	6 40	3½		Champlain -	9 45	3	2
Chateau Bay -	7 35	3½	1	Batiscan -	9 48	3½	2
Red Bay -	7 45	3½	1½	Antigonish Harb. -	9 0	4	2
Bradore Bay -	8 45	4	2	Three Rivers -	11 30	1	
Belles Amour Bay	9 0	4½	2½	<i>Gulf St. Lawrence.</i>			
				St. Paul Id. -	8 0	5	3
				Magdalen Islands -	8 20	3	2

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Gaspé Basin -	2 40	5	3	Port-au-Choix, (N. W. Coast) -	10 47	5	
Point Macquereau -	2 0	5	3	Petit Port, Bay of Islands -	10 42	5½	
Carleton Point -	3 0	6	4	Codroy Island -	9 15	6	4
Dalhousie Harb. -	3 10	9		Port Basque -	8 55	5½	3½
Campbell Town, Ristegouche R. }	4 0	10	7	La Poile Bay -	9 0	6	4
Bathurst -	3 15	7	4	<i>Hudson Strait.</i>			
Shippigan -	3 42	5½	2	Button Islands -	6 50		
Caraquette Harbour	2 40	6	3	Fury and Flecla Strait, Melville Peninsula -	7 0	8	
Miscou -	2 30	5	3	<i>Hudson Bay.</i>			
Miramichi Bar -	5 30	5	3	York Factory -	11 15	10-14	
Sheldrake Island -	6 0	5	3	<i>Arctic Regions, Greenland, West Coast.</i>			
Win Harbour -	5 45	5	3	Julianshaab -	5 6	7	5
Beaubère Island -	6 30	6	4	Frederickshaab -	6 3	12½	9½
Point Escumenac -	4 10	4	2½	Holsteinborg -	6 30	10	
Richibucto River -	3 30	4	2½	Upervik -	11 0	8	
Buctouche River -	7 0?	4?	2?	Wolstenholm Sound -	11 8	7½	
Cocagne River -	7 30?	4?	2?	<i>Barrow Strait.</i>			
<i>Newfoundland.</i>				Port Leopold -	12 6	6	4½
St. Pierre -	8 33	6½	4½	Erebus Bay -	12 6	8	
Lamalin Harbour -	9 15	8½		Griffith Island -	12 15	9½	2½
Great and Little Lann -	8 15	7	4	<i>Melville Island.</i>			
Great St. Lawrence Harbour }	8 30	7	4	Winter Harbour -	1 30		
Barin Harbour -	8 45	6½	4½	Dealy Id., Bridport Inlet -	1 48	4	
St. Mary Harbour -	7 40	7½	5	<i>Baring Island.</i>			
North Harbour -	8 0	7½	5	Bay of Mercy -		2	
Cape St. Mary -	8 30	7	5	Prince of Wales Strait -		3	
Placentia -	8 30	7	5	<i>Africa, South Coast.</i>			
Trepassey Harbour	7 0	6½	5	Simons Bay -	2 44	5½	3½
Cape Race -	7 0	6½	5	Dyer Island -	2 50	5	
St. Johns -	7 30	6	4	Cape Agulhas -	2 50	5	
Harbour Grace -	7 30?	7?		Mossel Bay -	3 30	6	
Bull Id., Trinity Bay	7 22	3½	2	Nysna Harbour -	3 45	5	
Hearts Content „	7 30	4	2½	Plettenberg Bay -	3 10	6	
New Perlican Harbour „	7 30	4	2½	Flesh Bay or Bay St. Bras -	3 30?	6?	
Trinity Harbour „	7 10	3½	2	Algoa Bay -	4 0	4-5	
Catalina Harbour	7 0	6	4	Bird Islands -	4 0	4-5	
Barrow Harbour -	7 10?	5?		Waterloo Bay -	4 0	6	
Fogo Island -	7 20	4		Buffalo River (entrance) -	3 45	4½	
Funk Island -	7 0?	2-3?		St. John River -	4 0	5	
Triton Harbour -	7 0?	2-4?					
Cutwell Harbour -	7 0?	2-4?					
Fleur de Lis Harb. -	7 15	2-4					
Rouge Harbour -	7 0?	2-4?					
Croc Harbour -	6 30	4½					
St. Julien Harbour {	7 21 A.M. } 4½		3				
Goose Cove -	7 0?	2-3?					
Braha Harbour -	7 0?	2-3?					
Lunaire Bay -	7 0?	2-3?					
Grigoet Bays -	7 0?	2-3?					
Sacred E., (N. Cst.)	7 23	2½					
Cook Harb. (N. Cst.)	7 25	3?					
Good Bay -	10 40	7½	5½				
St. John Harbour	10 40	7½	5½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port Natal -	4 30	6		Zeyla (Gulf of Aden)	7 15	8½	
Delagoa Bay, Eng- } lish River (Por- } tuguese Factory) } " (Port Melville) } " Shefeen Island }	5 20 4 30 4 40	12 15 12		Ghubbet Ne. Socotra	7 0	7	
				Gollonsir -	7 20	8	
				Bander Sháab -	7 0	7	
				Abd-al-Kuri -	8 30	6	
				Kal Farun -	8 20	6	
<i>Africa, East Coast.</i>				<i>Madagascar, East Coast.</i>			
Inhambane River -	4 15	10		British Sound -	4 0	9½	
Cape Bazaruto -	4 15	10		Port Leven -	3 30	7½	
Sofala River -	4 0	19		Andrava Bay -	3 30	7	
Quilimane River } (entrance) - }	4 15	16		Antongil Bay } (Port Choiseul) }	4 0	5	
Zambezi River } (Pearl Island) }	4 30	12 - 15		Tangtang Harbour	4 30	6	
Luabo River (entr.)		22		Madame Island, St. }	4 0	5	
Angoxa River -		13		Mary Harbour }			
Mozambique Har- } bour - }	4 15	12		Tamatave -	4 18	8	
Pomba Bay -	4 0	15	11	Fort Dauphin -	4 30	7	
Oibo Harbour -	4 15	6		<i>Madagascar, West Coast.</i>			
Mahato Island -	4 30	7		St. Augustine Bay	4 30	13	
Cape Delgado -	4 0	16	11½	Noss or Sandy Id.	5 0	15	
Rovuma River -	4 0	16	11½	Cape St. Vincent -	4 45	12	
Pimlea Harbour -	4 30	12		Mourondava -	4 45	12	
Mungullo or } Mongallo River }	4 45	12		Barren Islands -	4 45	12	
Lindy River (en- } trance) - }	4 15	12		Boteler River -	4 30?	15?	
Kiswara Harbour -	4 30	12		Boyanna Bay -	4 30	15	
Quiloa -	4 45	12		Makumba River -	4 45	17	
Latham Island -	4 0	10		Bembatooka Bay -	4 30	16	
Zanzibar (Channel)	4 15	11		Majambo Bay -	4 30	16	
Zanzibar -	4 20	10		Narrinda Bay -	4 30	15	
Pemba Channel -	4 0	11		Port Mazambo -	4 30	15	
Port Cockburn, } Pemba Id. - }	4 15	12		Port Radama -	4 40	13	
Melinda -	4 0	11		Passandava Bay -	5 0	15	
Mombaza -	4 15	11		Dalrymple Bay -	5 0	15	
Lamo Harbour -	4 6	11		Minow Islands -	5 0	15	
Patta Bay -	4 30	10		St. Juan de Nova -		5	
Port Durnford -	4 45	12		<i>Red Sea.</i>			
Brava -	4 30	8		Bab-el-Mandeb St.	12 0	7	
Marka or Muerka -	4 30	8		Mocha Road (East } Coast) - }	12 0	4½	
Magadoxa -	4 30	8		Massowah -	1 0	3	
Warsheek Roads -	4 30	8		Loheia -	1 30	3	
Rás Hafún or Ha- } foon - }	6 15	4		Sale Macowa -	0 30	2	
Cape Guardafui or } Ras Jerdaffoon }	6 15	6		Jiddah -		3	
Bander Alúleh -	6 45	6		Murdounah Island }	6 0	3	
Bander Gorí -	8 45			(East Coast) - }			
Berbereh or }				Omaider Island }	6 0	4	
Burburra (Gulf } of Aden) - }	7 15	9		(Gulf of Akabah) }			
				Rás Mahommed }	6 0	5	
				(Gulf of Akabah) }			
				Ushruffi Islands -	6 14	2	
				Suez Bay (head of } Gulf) - }	2 0	6	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Arabia, S.E. Coast.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bab-el-Mandeb } Srt. (Perim Id.) }	12 0	7		Dunbar " -	10 10	8	
Bander Feikam =	10 0	8½		Kedewarry " -	9 57	9	
Aden & adjacent. } Bays* - - }	7 30 to 9 30	7	4½	Hukkar River (en- trance) - }	10 30	11	
Sughrá - - -	8 0	6		Koree River (Mon- da Point) - }	11 40	11	
Makátein - - -	9 0	6		Bate (Gulfof Cutch)	12 20	12	8
Rás-al-'Asidah -	8 30	5½		Jooria " -	2 0	16	12½
Makalleh - - -	8 30	7		Gooriya Creek } (entrance) - }	11 0	9	
Rás Sharmah - -	9 0	8		Mandavee Roads -	11 50	15	11
Merbát - - -	9 0	6¾		Jaffrabat - - -	11 35	9	7½
Kuriyán Muriyán } Bay & Islands }	8 20	6½		Raujpoor (entrance, Gulf of Cambay) }	2 15	18	13½
Cape Isolette - -	9 0	10		Pur Bunder - - -	9 45	6	
Sháb Kadún - - -	9 20	10		Diu Island - - -	2 0	6	
Jezirat Hamar-al- nafur - - - }	9 30	10		Cambay - - - -	5 20	28	
Sháb-bu-saifeh -	9 45	10		Surat - - - - -	4 0	19	
Ghubbet Hashish -	10 0	10		Damaun (Bar) - -	1 30	17	
Om-rasas-Masírah	10 0	10		Versavah - - -	0 15	16	
Rás Shébali - - -	10 0	10		Nansaree River, } (Bar) - - - }	3 0	18	
Rás-al-Hed - - -	9 30	9		Gundavee River } (entrance) - }	2 0	19	
Khór Jerameh - -	9 30	10		Bulsaur R. (entr.)	1 45	18	
Persian Gulf.†				Omersary River „-	1 45	18	
Maskat - - - -	11 15	6		Dando River „ „	1 30	17	
Jezirat Jún - - -	11 30	10		Manorah River „-	1 30	16	
Rás al Kheī meh -	11 45	7		Bombay Dockyard	11 40	12-17	
Al Bida' - - - -	8 30?	6?		Rajahpoor Harbour	11 0	12	
Bahreīn - - - -	5 30	7		Bancoot River } (entrance) - }	2 0	12	
Jezirat Arabī - -	6 30?			Geriah Harbour -	2 40	9	
Jezirat Kabr - - -		8½		Angria Bank - - -	10 30	9	
Koweit - - - - -	0 15	9		Dewghur Harbour	11 25	9	
Basrah (Bar) - - -	12 0			Goa - - - - - - -	11 30	6	
Jezirat Kharg or } Khāreg - - - }	8 0	6½		Carwar or Seda- shigur Bay† - }	10 0		
Abū-shehr - - - -	7 30	7		Agoada Point - -	10 30	9	
Umm en Nakheī- lah - - - - - }	7 30?	8?		Merjee River - - -	11 0	7	
Tahri - - - - - -	5 0?			Calicut Roads - -	0 15	5	
Jezirat Kais - - -	0 45	7½		Beypoor River (en- trance) - - - }	0 15	5	
Jezirat Tumb - - -		8		Cochin Harbour } and Road - - }	1 0	3½	
Lingeh - - - - -	12 0?			Ceylon, South Coast.			
Básidúh - - - - -	12 0	10		Colombo - - - - -	1 0	2	
Kesm - - - - - -	11 0	12		Dodandowe Bay - -	1 50	1½	
Jezirat Lárek - -	10 15			Pointe de Galle - -	2 0	2	
Basrah Town - - -	6 0?	9		Belligam or Red Bay	2 20	2½	
Jashk Shoal, } Beloochistan - }	9 30	8		Kirindi - - - - -	3 30		
Hindoostan, West Coast.				Batticalao River -	5 0	2-3	
Manora Point (en- trance to Karachi Harbour) - - }	10 30	9½	6	Trincomalie Har- bour - - - - - }	8 18	2	1½
Gizree Bunder } (Mouth of Indus) }	9 50	7		Palmeira Point - -	9 30	7-11	
Pitty " - - - - -	10 5	9					

* From a survey of Aden anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

† Deduced from observations made in the E.I.C. brig Euphrates 1857-58, and H.M. schooner Marie of the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiffe of H.M. Indian Navy.

‡ Spring tides rise, a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Bay of Bengal, West Coast.				Islands in Indian Ocean.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tuticorin Har- bour and Road, (Gulf of Manar)	1 15	2½	1½	Kerguelen(Christ- mas Harbour) -	2 0	2	
Keelacarry -	11 0			St. Paul Island -	11 0	3	
Paumben Pass -	1 30	2		Amsterdam Id. -	11 0	3	
Kitnapatnam(West side of Palk Strait)	11 0	1½		Mauritius, Port Louis -	12 30	3	2½
Negapatam -	5 0	3		" Grand Port -	1 0	1½	
Nagore -	8 15			Reunion or Bour- bon Island,	Noon	3½	
Madras Road -	7 34	3½		(St. Pierre)			
Pulicat Shoals -	9 25	2½		" (St. Denis) -	0 22	2½	
False Point -	8 0	8		" (St. Gilles) -	1 0	2½	
Point Divy -		5		" (St. Paul) -	1 7	4	
Coringa or Coca- nada Bay	9 10	4-5	8	Rodrigue Island -	1 45	6	
" River (Bar)	9 0	5		Cargados Garayos Shoals -	2 0	4	
Balasore River -	10 0	15		Chagos Archipel- ago, (Diego Garcia) -	1 30	6	
Kedgerie -	11 30			Seychelle Archi- pelago, (Mayhé Island) -	4 0	6½	
Saugor Island -		12		Curieuse Island -	5 10	7	
Western light ves- sel (entrance to Hoogly) -	10 0	10½		Peros Banhos -	1 30	5	
Mutlah River, Western or Ward's Channel	9 0	10		Amirauté Isles, (St. Joseph I.)	5 0	8½	
" (entrance to Biddah River)	10 0	14		Comoro Islands, (Maroni Bay, Comoro) -	4 53	10	
" (Muda Kali)	11 45	15		" (Douany, Mohilla) -	4 0	11-12	
Calcutta -	2 30			Comoro Islands, (Numa-Choa, Mohilla) -	3 0	14	
Bay of Bengal, East Coast.				" (Anchorage, Johanna)	3 40	11	
Hastings Harbour	10 40	13½		" (Pomony Harbour, Johanna) -	4 0	11	
(Mergui Archi- pelago) -				" Zaudzi An- chorage, Mayotta) -	4 10	12	
Mergui -	10 30	18		Aldabra Islands -	5 0	10	
Tavoy River, (en- trance)	10 30	20		Maldives, Adou Atoll	1 0	4	
Maulmain " -	2 0	22	17	" Suadiva Atoll	1 0	4	
Martaban -	2 20	21		Maldives, Adou Matte Atoll	3 0	4	
Rangoon R.(entrance)	3 15	21	14	" Malé	12 30	3	
Rangoon -	5 30	21	14	" Malcolm Atoll	10 30	3	
Bassein River	10 0	9	6	" Heawandou Pholo Atoll	9 30	5	
(entrance) -				Laccadives, Cher- baniani Reef -	10 0	7	4
Ramree Road -	10 0	12					
Kijouk Phyou	10 0	9	6				
Harbour -							
Akyab, Aracan	9 45	9	6				
River (Bar) -							
Naafe River (en- trance) -	10 0						
Cheduba Island -	11 30	8					
Diamond Island -	10 30	8					
Chittagong (Bar) -	1 15	15	10				

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	h. m.	ft.	ft.
Tamareed, Socotra	7 20	8	
Keeling Islands } (Port Refuge) - }	5 30	5	
Christmas Id. -	10 0		
Nicobar Islands, } Nancowry Har- } bour - }	9 15	8½	
Andaman Islands, } Port Blair } " Port Corn- } wallis - }	10 0	9	6
" Andaman } Strait }	10 24	9¼	
<i>Malacca Strait, Malay Coast.</i>			
Junkseylon Island } (East side) - }	10 0	11½	
Queda -	12 0	5½	
Penang (George- } town) - }	12 0	9	7½
Lt. Vessel (One } Fathom Bank) }	6 0	15	12
Arroa -		10	
Cape Rachada -	5 30	13	
Sambilangs -		12	10½
Malacca Road -	7 30	11	8½
Off Mount Formosa	8 0	11	8½
Tanjong Bolus -	9 30	10½	8½
North Sands -	5 30	15	12½
Singapore, New } Harbour - }	9 45	10	7½
Rhio -	10 0	7	5
<i>Malacca Strait, Sumatra Coast.</i>			
Diamond Point -	12 0	9½	
Siak River (en- } trance) - }	9 0	12	
" off the town -		11	
<i>Timor, East End.</i>			
Koepong -	11 0	9	6½
<i>Sumba or Sandelhout, North Coast.</i>			
Nangamesie Har- } bour - }	11 30	17	13½
Palmado Road -		15	
<i>Sumbawa.</i>			
Ragged Island -	8 10	3	
Sapie Bay -	1 0	10	
Britannia Bay -	1 0	11-12	
Bima Bay -	Noon	6	
<i>Lombok, West Coast.</i>			
Ampanam Bay -	8 0	6	
Fidloe Bay -		10-12	

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	<i>Baly.</i>	h. m.	ft.
Badong Bay } (South Coast) - }	11 0	9½	
Tebonkos Road } (North Coast) }	5 0	6½	
<i>Java.</i>			
Pampang Bay -		7-8	
Tylatiap Harb. } (South Coast) - }	8 45	3½	
Wynkoops Bay } (S.W. Coast) - }	5 0	5½	4
Bantam -		5	
Batavia -	10 0	2	
Krakatoa -	7 0	4	
<i>Sumatra, N.E. Coast.</i>			
Pulo Aor -		5	
St. Barbe -	6 0	6	
Badas Id., Linga } Bay* - }	6 O.P.M.	12	
Delhi River -	4 0	8	
<i>Sumatra, West Coast.</i>			
Bencoolen -	6 0	3-5	
Sillebar River (Bar)	6 0	4½	
Mensular Island } (S.E. end) - }	6 0	4	
Tappanooly Har- } bour - }	6 10	6	
Acheen Head -	8 45	8	
<i>Durian Strait.</i>			
Sabon Island -		10	
Deep Point -	5 0	10	
Red Island -	5 0	10½	
<i>Banka Strait.</i>			
Toboe Ali Point - {	8 30 P.M.† 10 0 A.M.†	12	
Incipara Pass -	irr.	10	7½
Nangka Island -	7 0	9¾	
Cape Oelar -	6 30	12	
Bersiapi Point -	6 30	12	
Kalian Point -	8 17½	12½	
Lobah Point -	11 0†	10	
<i>Gaspar Strait.</i>			
Pulo Mendanao -	2 30	4	
Pulo Leat -	2 30	4	
<i>Java Sea.</i>			
Crimon Islands -	8 0	6	5
<i>Celebes.</i>			
Macassar -	4 0	54½	

* From observations made in the month of September by W. Stanton, Master Commanding U.S. Surveying Brig, Saracen.

† In S.E. Monsoon.

† In N.W. Monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Flores Seu.</i>					h. m.	ft.	ft.
Adenara, Flores -		8		Burong Island -	4 45	7	
<i>Moluccas.</i>				Rajang River -	4 45	13	9
Batchian, Gilolo -	1 0	6		Bruit River -	3 0	11	
Sanguir Island -		6		Bintula River -	5 45	6	
Gèby, Fohou Island		5		Labuan Island -	9 45	6	
Wahaay Harbour, } Ceram - }	6 0	8		Mungalum Island -	11 0	5	
Bouro, Cajeli Bay	1 0	6		Bruni River -	11 0	12	
Amboyna -	0 32	7		Dalawan Bay } (Balabac Is- }	11 0	5	
Saparooa Island -		6		land) - }			
Cambing or Pas- } sage Island - }	noon	6		North Balabac } Strait - }	10 50	5	
Banda, Banda Islands	4 0	6 ?		Malludu Bay, } Borneo N. Coast }	10 30	6 - 8	
Dampier Strait -		11		Balambangan Id. -	10 0	6 - 8?	
<i>Filipinas.</i>				Unsang (Borneo, } N.E. Coast) - }	8 0	3½	
Port Zebú -	12 0	7		Ragged Point, } Borneo, E. Coast }		7	
Port Buluagan } O'sta Ana - }	12 0	5½		Famarung Islands } (Borneo East }		8 - 10	
Port Iliolo -	12 0	5½		Coast) - }			
Port San Jacinto, } Ticao Island - }	6 30	6		Eran Bay (Pala- } wan, West }	10 10	6½	
Mindanao -	7 0	6		Coast) - }			
Manila (Luzon) -	10 40	2½		Tay-bay-oo-bay }	10 15	6	
Port Sual "		6		" }			
PortLaguimanoc "	1 30	5½		Ooloogan Bay "	9 30	5½	
Alabat Harbour "	10 0	9		Mayday Bay "	9 55	3½	
Paloan Bay (Min- } doro) - }		5		Port Barton } (Bubon Point) "	10 55	6	
Ensuanga(Buriasld.)	12 30	6		Pancol "	9 40	6	
<i>Loo Choo Islands.</i>				Bacuit Bay "	10 0	6	
Nafa-Kiang -	6 28	7		Cavern Island "	9 30	5½	
Port Oonting -	6 35	8		Observatory } Island - }	11 0	5½	
Oho Sima, Vin- } cennes Bay - }	7 30	5½		Ursula Island } (Palawan, East }	11 0	7½	
<i>Bonin Islands.</i>				Coast) - }			
Port Lloyd, Peel } Island - }	6 8	3		Port Royalist -	11 0?	6½?	
New Port, Hills- } borough Id. - }	11 32	3½		Millman Island } (Palawan, West }	10 27	2½	
<i>China Sea, East Coast.</i>				Coast) - }			
St. Pierre, Island -		4		Casuarina Point, "	9 30	6½	
RendezvousIsland, } Borneo, S.W. }		8		Barren Island "	9 30	5½	
Coast - }				Bird Island "	9 30	6	
Tanjong Api -		7		Tai-Tai Bay -	9 30	5½	
Sarawak River } (Moratabas en- }	4 0	9	5½	Batanes, Bashee } Islands - }		4	
trance) - }				Port Kok-si-kon } (Formoza, East }	11 30	3	
" Santubong -	4 0	10	6	Coast) - }			
" Sarawak }	5 0	15 - 18	9	Tam-Sui Harbour }	11 45	7-12	
Junction }				" }			
" " City	5 20	15 - 18	9	Kelung Harbour } (Formoza, N. }	10 30	3	
				Coast) - }			
				Sau-o Bay -	10 0	3½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Babuyan Islands.</i>					<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Port Pio Quinto, } Camiguin Island } Port Musa, Fuga } or New Babuyan }	6 0	6		Lankeet Id., Can- ton River	11 20	6½	
				Lintin Id. "	12 0	7½	
				Fan-si-ak Channel,,	1 0	7½	5
		5		Chuen-pee Point "	2 0	7½	
				† Wham- { Mar. -	1 40		
				poa Dks. { April -	1 15	7-8	
				{ May &			
				{ June -	0 30		
				Kuper Id. { Mar. -	2 40	5½	
				off Canton { May &			
				City { June -	1 40	5½	
				Sam-shui, SiKiang }		5-6	
				or West River. }			
				Shao-king "		3	
				Wu-chu "		1-1½	
				Hong Kong Road-	10 15	4½	
				Ninepin Group -	10 0	5	
				Tide Cove, Mirs Bay	10 0	6½	
				Tooni-ang Id. Bias }	8 0		
				Bay - }			
				Tsang-chow Id. }	8 30		
				Bias Bay - }			
				Hong-hai Bay -	10 0	6½	
				Kin-siang Point, }	7 0		
				Hie-chechin Bay }			
				Cupchi Point -	8 0		
				Hai-mun Bay -	9 0	7?	
				Cape of Good Hope	9 0	7?	
				Swatau (Double Id.)	3 0	9	
				Clipper Road, Na-			
				moa Id. - }	11 15	7	
				Chauau Bay -	11 0	6½	
				Tongsang Harbour	11 30	12	
				Chimney Id. Rees }	11 30	12	
				Pass - }			
				Makung Harbour }	10 30	9½	7
				(Pescadores) - }			
				Amoy, Inner Harb.	12 0	18½	14½
				Hu-i-tau Bay -	12 15	16	
				Chimmo Bay -	10 20	16	
				Chincnu Harbour -	12 25	17	
				Meichen Sound -	12 30	17	
				Hai Tau Strait -	12 15?	16?	
				White Dog Ids. -	9 0	18	
				Min River, Tem-			
				ple Point - }	10 45	19	14½
				Min R., Losing Id.	12 0		
				Chang-chi Island -	9 30	17	
				Spider Island -	10 0	17	
				Lishan Bay -	10 15	16	
				Namquan Harbour	10 0	17	
				Namki Islands	8 30	17	
				Pih-ki-shan Ids. -	8 30	17	
				Fong-whang-			
				group, Bullock }	8 30	17	
				Harbour - }			
<i>China Sea, West Coast.</i>							
Romania Point, }	10 30						
(Malay Penin- }							
sula, E. Coast) }							
Sedili River (en- }	9 44	7					
trance) " }							
Blair Harbour "	8 50	9					
Pulo Timooan (West }	6 0	7½					
side) - }							
Birkang Bay (Co- }	11 30	5					
chin China) - }							
Tringano River }							
(Gulf of Siam, }	8 0	7					
West Coast) - }							
Menam River, }	5 7	9½					
Painam " }							
Cape Liant (Gulf }	5 7	6½					
of Siam, E. Coast) }							
Chentabun River }	10 0	5½					
(entrance) " }							
Rocky Island (Gulf }	4 0	4					
of Siam, E. Coast) }							
Pulo Panjang -	7 0	2					
Pulo Condore }	2 30	6½					
(Cochin China)* }							
Saigon, Cochin }							
China, Cape St. }	11 0	8					
James - }							
" Saigon City }	5 30	9½					
Nhatrang Bay }							
(Cochin China, }	8 30	5½					
E. Coast - }							
Hou-cohe Bay "	11 30	5					
Turon Bay "	3 0	4					
Galang Bay }							
Hainan Island, }		4-5					
Tien-pak Harbour }	12 0	8½					
(China, E. Coast) }							
Pratas Shoal -	4 0	5					
Canton River }	10 0	8					
(entrance) - }							
Broadway River }	11 0	7½					
(entrance) - }							
Typa Anchorage -	10 0	7					
Macao -	10 0	6½					
Cumsingmun Har- }	12 6	6½					
bour, Canton R. }							
Junk Fleet entr. "	11 50	6½					
Tailung Channel "	1 30	6½					

* From a French Survey, 1862.

† At Whampoa Docks—In March, the day and night tides rise to the same level. From April to October, the day tides are the higher, and from November to February the lower. In May and June the level of spring tides is 4 feet, and the neaps 2 feet higher than in March.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wan-chu River (ent.)	9 0	15½		Ta-tsing ho	4 10	10½	8
" City	9 30	15½		Peiho or Peking River (entr.)†	3 40	10	7½
Towan Island	9 20	13		Tien-tsin, Peiho River	7 0	4½	
Tai-chow Islands	9 0	14		Peh-tang ho	3 33	10	7½
St. George Id.	10 20	15		Sha-lui-tien Banks (west part)	2 50	10	8
San-moon Bay	9 30	14		Liau-tung, Ching ho	1 20	6½	
Kweshan Islands	10 30	20		Lau-mu ho	1 30	5	
Nimrod Sound	9 40	14		Tai-cho ho	0 15	6	
Vernon Channel, Chusan Archipelago	11 0	12	9	Yang ho	0 15	6	
Ting-hae Harbour	8 15	12		Ning-hai	12 0	6	
Poo-too Island	10 0	13		Sand Point, Gulf of Liau-tung)	4 50	7	5½
Lansew Bay	11 30	15		N.W. Head of Gulf of Liau-tung	5 30	10	8½
Volcano Islands	11 0	14		Liau Ho (Bar)	4 0	11½	7½
East Saddle Island	11 20	12½		" (entrance)	5 0	12	
Yung River, Chin-hae	1 0	9		Vansittarts Saddle	4 20	10	8½
" Ning-po-fu	11 45	14		Hulu Shan Bay	2 30	8	6
Hang-chu Bay, Seshan Ids.	11 45	17		Society Bay, Suli-van Bay	0 15	8	
" Fog Islands	12 0	25		Port Adams, Mary Island	2 0	10	
" Chapu Road		32		Pigeon Bay	11 45	8	
Hang-chu Bay (off Can-pu)	11 30	15		Ta-lien-whan Bay	10 47	10½	8
Gutzlaff Island	12 0	15	10	Encounter Rock	10 44	11	8
Yang-tse Kiang (light ship at entrance)	0 30	15	10½	Haiyun-tau (Thornton Haven)	9 30	12	8
" entrance to Wusung River	0 35	13	8	Chodo Id., Korea, W.C.	6 20	12	
Pheasant Point, Wusung River	0 40	10	7	Basil Bay	4 15	18	10
Shanghai	1 40	12	8	Marjoribanks Harbour	3 30	29	
*Langshan Crossing				Ko-kun-to Group, Korea, S. Coast,	2 25	18	10
<i>Yellow Sea.</i>				Kuper Harb.	9 28	11½	8½
Wang-kia-tai Bay	6 0	12	9	" Crichton Harb.	9 50	11½	8½
Wei-hai or Kyau-chau Bay	5 0	12	9	" S. Coast,	8 58	11½	8½
Ching-tau Bay	6 0	12	9	Tracy Island	9 10	11½	8½
Lo-shan-kau	4 30	11	9	" Hooper Id.	8 30	11	
Staunton Island	1 30	8	5½	" Port Hamilton			
Wang-kia Bay	2 30	9	7	<i>Japan Sea.</i>			
Shihtau Bay	1 30	9	7	Yung-hing Bay	5 20	2½	
Sang-tau Bay	0 55	7	4½	Tsau-liang-hai or Chosau Harbour (Korea)	7 45	7	5
Aylen Bay	2 30	6	4	Nagasaki Bay (Nipon, S. C.)	7 15	9	7½
Litau Bay	3 0	6	4	Tama no Ura Harb., Goto Id.		6-8	4-6
Wei-hai-wei Harbour	9 30	9		Iki		8	
Lung-mun Harbour	10 0	7	6½	Tsu sima Sound	8 30	8	6
Chifu	10 34	8		Simonoseki	8 30	8	
Hope Sound (Miau-tau Group)	10 24	6½		Sado (Yebisu)	5 0	2	
Miau-tau (Deft Bay)	10 35	6		Tsugar Strait	5 0	5	

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actmon, 1861.
† Time and rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	<i>Middle Island, East and North Coasts.</i>			
Hakodadi Har- bour, Yezo Id. }	5 0	3		Bluff Harbour -	1 18	8	6
Endermo Har- bour, Yezo Id. }	5 30	6		Molyneux Bay -	3 0	8	6
La Perouse Strait -	10 30	6		Otago Harbour }	2 50	7	5
Toku-hama, Yedo }	6 0	6½	4½	(entrance) -	3 24	8	6
Bay -				Akaroa Harbour -	3 50	7½	5½
Tsuyama Bay -	5 50	5		Port Lyttelton, }			
Futuzio -	6 0	5		formerly Port }			
Port Simoda -	5 0	3-5		Cooper -	5 30	8	6
Heda Bay -		5½		Kaikora Peninsula	6 0	8	6
Enora Bay -		4		Cape Campbell -	6 10	8	6
Simoda -	7 30	7		Port Underwood -	8 50	8	6
Urakami -	7 30	6	5	Queen Charlotte }	9 0	8	6
Ujima -	6 50	5		Sound (entrance) }	9 35	11	7
Tanabé Ki Channel	6 0	6	5½	Port Gore -	9 55	8	6
Uranouchi „ -		5		Pelorus Sound }	9 0	12	8
Uaki „ -	5 55	6½		(entrance) -	9 50	14	10
Hago and Corvi }	irr.	5		Port Hardy -	8 45	13	9
Bays -				Croisilles Harbour	9 50	14	10
San Channel -	6 4	6½		Nelson -	8 45	13	9
Fura Harbour „ -	6 5	6½		Massacre Bay. }			
Nuruto (Fukura) „	6 17	7		Tasman Corner }	9 50	14	10
Akasi -	6 36	6½?		—Motu Pipi }	9 20	14	10
Awajima (Inland }	0 14	7		River, W. Ent. }			
Sea) -				Cape Farewell -			
T-mo (Seto-uchi)	11 0?		5				
<i>Gulf of Tartary.</i>				<i>Middle Island, South and West Coasts.</i>			
St. Vladimir Bay	irr.	2		Ruapuke Id. (Fo- }	1 0	8	6
Napoleon Road }	2 30	2½		veaux St.) -	12 15	8	6
(West Coast) -				Centre Id. (Fo- }	11 20	8	6
Port Michael Sey- }	5 30	3		veaux St.) -	11 5	8	6
mour -				Preservation Inlet	11 15	10	8
Barracouta Har- }	10 0	3½		Chalky Inlet -	11 30	8	6
bour „ -				Dusky Bay -	11 30	8	6
Castries Bay „ -	10 30	6		Daggs Sound -	10 45	8	6
Jacquiere Bay }	10 0	6		Thompson Sound -	9 15	8	6
(East Coast) -				Bligh Sound -	11 20	7	6
Amur Strait -	11 40	5-6		Milford Sound -			
Cape Maria (Sag- }	2 0	5		Wanganui Inlet -			
lalin Id.) Sea }							
of Okhotsk -							
<i>Kamchatka.</i>				<i>North Island, South and West Coasts.</i>			
Avacha Bay -	3 30	6½	4½	Port Nicholson, }	4 30	5	3
				Lambton Harbour }	7 0	8	6
				Mana Island -	9 0	6	
				Kapiti Island -	10 0	8	6
				Manawatu River -	10 15	8	6
				Wanganui River -	9 30	12	9
				New Plymouth }	9 30	12	9½
				(Taranaki) -	10 0	12	9
				Kawhia Harbour -	9 30	12	10
				Aotea Harbour -	10 55	10	8
				Waikato River -			
				Maukau Harbour }			
				(entrance) -			
				Kaipara Harbour }			
				(entrance) -			
<i>New Zealand:—South or Stewart Island.</i>							
Mason Bay -	11 10	8	6				
S.W. Cape -	12 0	7	5				
Port Pegasus -	11 50	8	6				
Port Adventure -	12 20	8	6				
Patersons Inlet -	1 10	8	6				
Port William -	12 45	8	6				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hokianga River } (entrance) - }	9 45	10		Sandy Cape -	7 50	6 - 8	
" (Kokohu) -	10 15	10	7	Port Curtis -	9 40	10 - 12	
Cape Maria Van } Diemen - }	8 0	7		Byron Bay -	9 45	6	
Three Kings Is- } lands - }	8 0	7		Wreck Reef, } (Bird Islet) - }	8 3	6	
<i>North Island, East Coast.</i>				Cato Bank -	8 0	6	
Cape Palliser -	6 0	6		Lady Elliot Islet -	9 0	7 - 8	
Wairoa River -	6 45	7	4	Heron Islet, } Capricorn Group }	9 0	10	
Hawke Bay } (Ahuriri Har- } bour) - }	7 50	3		Keppel Bay -	9 30	9 - 14	
Poverty Bay -	6 5	6		Great Barrier Reef	8 48	7	
East Cape -	8 55	7		Saumarez Reef -	8 0	6	
Hicks Bay -	9 0	7		Frederick Reef -	8 0	6	
Tauranga Harbour	7 10	6	4½	Kenn Reef -	8 0	5½	
Mercury Bay -	7 21	7	5	Middle Bellona Reefs	8 30	6	
Gt. Barrier Island } (Nagle Cove) - }	6 25	10	7	Avon Isles -	8 30	5	
Auckland Harbour	7 5	11	9	Chesterfield Islet -	8 30	5	
Kawau Island -	6 30	10	7	Mellish Reef (Sand } Cay) - }	7 55	5 - 6	
Wangari Harbour -	7 0	9	7	Thirsty Sound -	10 45	12 - 18	
Tutukaka Harbour	7 0	9	7	Port Bowen -	9 35	16	
Wangaruru Harbour	7 10	9	7	Shoal Water Bay -	10 30	12 - 18	
Bay of Islands, } (Motu Mea Islet) }	7 15	9	6	Broad Sound -	11 0	20 - 30	
Wangaroa Harbour	8 15	7		Swain Reefs -	10 25	10	
Cavalli Islands -	8 0	7		Percy Isles, Middle } or No. 2 Island }	10 30	16	13
Monganui Harbour	8 15	9	7	(West Bay) -			
Awanui River -	7 44	7		" South or } No. 1 Islet, }	10 30	14	
Parenga-renga } Harbour - }	7 54	7		(N.W. Bay) -			
<i>Australia, East Coast.</i>				West Hill -	10 20	24	
Twofold Bay -	10 0	7	5	Cape Conway -	11 0	18	
Botany Bay -	8 15	7 - 8		Goold Island -	6 45	6	
Jervis Bay -	6 20	6 - 9		Port Denison -	9 30	6	
Port Jackson, } North Head - }	8 15			Upstart Bay -	9 0	6	
Sydney -	8 38	4½	4	Cleveland Bay -	7 30	10 - 12	
Broken Bay -	8 0	6 - 9		Dunk Island -	9 28	6 - 10	
Newcastle or Port } Hunter - }	9 45	6 - 7		Fitz-Roy Island -	9 15	7 - 12	
Port Stephen -	9 0	6		Endeavour River -	8 0	5 - 10	
Manning River -	9 15	4		Trinity Opening, } Great Barrier }	9 15	7 - 12	
Crowdy Head -	9 15	5		Reefs - }			
Port Macquarie -	8 56	4 - 5		Lizard Island -	9 15	7 - 10	
Solitary Islands -	9 15	5	8	Willis Islets -	8 0	6	
Shoal Bay -	8 30			Osprey Reef -	8 36	6	
Richmond River -	9 20			Flinders Group -	9 15	8 - 12	
Cape Byron -	9 45	6		Cape Sidmouth -	9 15	10	
Tweed River } (Danger Point) }	9 45	5 - 8		Cape York -	11 15	10	7
Moreton Bay -	9 30	3 - 7		<i>Torres Strait.</i>			
Great Sandy Strait } (Woody Id.) - }	9 14	10	7	Sir Cs. Hardy Is. -	9 15	10	
				Raine Island -	8 10	10	
				Wallis Island -	Irreg.	7	
				Cape Possession -	9 0	6	
				Possession Island -	1 0	9½	
				Darnley Island -	9 30	12	
				Bramble Cay -	9 15	12	
				Murray Islands -	9 30	10	
				Adolphus Island -	12 15	10	
				Albany Islands } (Port Albany) }	12 15	10	7

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Charge.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Australia, North and North-West Coasts.					h. m.	ft.	ft.
Endeavour Strait, } E. Entrance - }	8 10	6		Sharks Bay, Cape } Perron - }	12 45	5½	
Booby Island -	4 30	8		„ Hamelin Pool	5 0	3½	
Albert River -	7 30	10 - 13	3 - 8	Australia, West Coast.			
W. Lesley Isles, In- } vestigator Road }	8 0	9		Port Gregory -	11 30	3	
Sir E. Pellew Isds.	7 30	4 - 7		Houtman Rocks -	11 30	2½	
Arnhem Bay -	8 10	6		Champion Bay -	9 10	1	
Vanderlin Island -	9 30	7	4	Cockburn Sound -	9 0	1 - 1½	
Cape Wilberforce -	8 10	10		Warnboro' Sound -		3 - 4	
Goulburn Isles -	6 0	5 - 6		Rottneat Island, }	7 50	2¾	
East Alligator River	8 15	15		Thompson Bay }			
Adam Bay -	6 0	18		Koombanah Bay -	9 0	2	
Shoal Bay -	6 0	18 - 25	14 - 20	Swan River, Gage }	8 50	2¾	
Port Essington -	3 24	13		Road - }			
St Asaph Bay -	5 45	14		„ Port Grey	9 0	1 - 1½	
Port Cockburn -	5 45	24		Australia, South Coast.			
„ Darwin -	5 30	17 - 24		Corner Inlet -	11 40	8	
„ Paterson -	4 0	16 - 24		Wilson Promontory	2 0	10	
„ Keats -	6 0	22		Port Western -	1 10	8	6
Peace Point -	6 55	20 - 26		Port Philip, Lons- }	9 42	7	5½
Victoria River, }	7 15	15 - 24		dale Point }			
Turtle Point - }				„ Queens Cliff	10 50	3	2
„ Holdfast Reach	9 0	16	10	„ Nepean Pt., }			
„ Mosquito Flat	0 19	7 - 13		(Quarantine }	10 53	2¾	1½
„ Sandy Island	1 17	3 - 10		Station) „ }			
Asaphus Island -	7 30	21		„ Dromana -	2 19	3	2½
Van Diemen Bay -	9 15	6		„ Schnapper }	2 14	2¾	2
Swift Bay -	12 0	18		Point - }			
Port Nelson -	12 0	27		„ Bellarine }	2 21	2½	2
Prince Frederick }	12 0	28		Jetty - }			
Harbour - }				„ Geelong }	2 30	3½	2½
Greening Bay -	11 45	30		(Bird Rock) }			
Prince Regent }				„ Hervey Point	2 39	3	2½
River, St. George }	12 20	24 - 37		„ Williamstown	2 31	2¾	2
Basin - }				„ Melbourne }			
Barrow Bay -	11 30	24 - 38		(Quay near }	2 48		
London Harbour -	11 30	30		the Bridge) }			
Montgomery Isles	12 0	36		Lady Bay -		4	
Miller Bay -	11 45	36		Port Fairy -		4	
Port Usborne, }	1 45	34		Portland Bay -	Midnight	4	
King Sound - }				Macdonnel Bay -	3 0	5	
Swan Point -	0 10	26		Rivoli Bay -	10 0	4	
King Sound (en- }	0 10	23		Port Elliot -		5 - 6	
trance) - }				Troubridge Shoals	3 30	6	
Beagle Bay -	11 30	13 - 15		Port Adelaide -	5 44	6	
Carnot „ -	0 30	13 - 14		Cape Willoughby, }	4 10	6	
Rock „ -	0 30	30	18	Kangaroo Id. - }			
Turtle Isle (North)	11 0	18	6	Pelican Lagoon, }	5 0	6	
Sandy Islet -	10 35	18		Kangaroo Id. - }			
Depach Isle -	10 40	14	6	Spencer Gulf:			
Hermite Isle -	10 0	14		Thorny Passage	12 0	6 - 8	
Starks Bay, Natu- }	11 45	6		Point Riley -	5 45	4¾	
raliste Channel }				Plank Point -	6 15	6 - 8	
„ Denham Sound	12 5	5		Port Pirie -	7 15	9 - 11	
„ Freycinet Reach	3 0	5		Point Webling	6 10	6 - 9	
„ „ Estuary	4 15	3½					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Spencer Gulf :	h. m.	ft.	ft.		h. m.	ft.	ft.
Point Lowly -	7 0	6 - 8		Banks Ids., Port			
Port Augusta* -	8 30	9 - 12		Sandwich,	5 30	4	
Wallaroo -	irr.	4 - 5		Malicolo Id.			
Gambier Islands -	1 50	3		„ Vita Harbour, } Sandwich Id. }	5 0	5	
Port Eyre -	10 30	6		„ Havannah } Harb. Sand- }	7 15	4	
St. Francis Isle, } Petrel Bay - }	12 0	6		wich Id. - }			
Blancheport, } Streaky Bay - }	1 0	5		„ Dillon Bay, Er- } romango Id. - }	5 30	4	
Smoky Bay -	12 15	6		Solomon Islands -	6 45	2	
Denial Bay -	12 15	6		Erronau or Futuna	7 24	4	
Fowlers Bay -	10 30	6		Sandalwood Bay, }	6 0	6?	
Venus Harbour -	2 15	6		Fijii Islands - }			
West Cape Howe -	9 0	6		Port Nukulan or }	6 47	5½	
Princess Royal } Harbour - }	11 56	1 - 4		Rewa Road, }			
				Fijii Ids. - }			
<i>Bass Strait.</i>				Balade Harbour, }	6 30	4?	
Refuge Cove -	12 5			New Caledonia }			
King Island -	1 0			Port Vao, Isle of }	8 6	4	
Hunter Island -	11 30	8		Pines, New }			
Three Hummock } Island, E. side - }	10 30	10		Caledonia - }			
Swan Island -	9 35	6		Prony Bay, New }			
Glennie Islands -	12 20			Caledonia - }			
Kent Island -	11 10			Port de France, }	8 25	4	
Murray Pass -	11 10	8		New Caledonia }			
				Port St. Vincent, }	5 50	4½	
				New Caledonia }			
<i>Tasmania.</i>				Woodlark Island }	7 15	4	
Circular Head -	11 40	9		Louisiade Archip. }			
Tamar River, Port }				Port Carteret, New }		6	
Dalrymple }	12 5	10	7½	Ireland - }			
(Georgetown) }				Lord Howe Island	8 30	6	
Tamar River, }				Norfolk Island -	7 45	7	
(Launceston) - }	1 0	12½		Campbell Island -	12 0	5	
Eddystone Point -	9 39	7		Raoul or Sunday Id.	6 0	5	
Georges Bay -	9 42	3	2				
Cape Pillar -	1 0	6		<i>Islands in North Pacific.</i>			
Port Arthur -	7 52	4		Karakoa Bay, }	3 49		
Hobarton -	8 15	4½	3½	Owyhee - }			
Macquarie Harb. -	7 30	3		Honoruru, Sand- }	4 0	2	
				wich Islands - }			
<i>Islands in South Pacific.</i>				Pouinipet Island, }	6 0	4½	
Easter Island -	2 0			Caroline Islands }			
Bow Island -	2 40	3		Seypan Island, }	6 45	2½	
Tabuai Id. -		3		(Ladrone Ids.) - }			
Tahiti or Otaheite Id.	noon.	1½		Pelew Islands -		6	
Resolution Bay, }							
Sta. Christina, }	2 30	4		<i>South America, Strait of Magellan.</i>			
Marquesas - }				Cape Virgin -	8 30	36 - 42	
Fannings Id. -		4		Cape Espiritu Santo	8 30	36 - 42	
Tongatabu -	6 50	4		Possession Bay -	9 0	36 - 42	
Port Resolution, }	5 35	3		Cape Orange -	3 0		
Tanna Island - }				First Narrows -	9 0	36 - 42	
Port Aneiteum, }	6 35	4		Philip Bay, east side	9 30	24	
Inyang - }				Gregory Bay -	9 45	23	
Banks Ids., Port }				Second Narrows -	10 0	23	
Patteson, Vanu }	6 40	5		Peckett Harbour -	12 0	6	
Lava Id. - }							

* At Port Augusta, when the wind veers round to West and South and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Laredo Bay -	11 30	9		Cape Inman -	2 0	4	
Santa Magdalena } Island - }	12 0	10		Latitude Bay -	2 5	4	
Port Famine -	12 0	6		Week Islands -	2 0	5	
Cape San Isidro -	1 0	8		Dislocation Harbour	1 40	4	
St. Nicolas Bay -	2 6			Diego Ramirez } Islands - }	4 0	6	
Cape Froward -	1 0			<i>Patagonia, West Coast.</i>			
Port San Antonio -	12 0	7		Evangelists -	1 0	5	
Labyrinth Islands-	0 30	5½		Port Henry -	12 0	5	
Port Gallant -	9 0	5½		" Barbara -	12 28	4	
York Road, } English Reach }	2 0	9		San Tadeo River -	11 45	6	
Bachelor River -	1 40	5		Port San Domingo	12 0	7	
Borja Bay -	1 50	6½		Piti-Palena -	12 23	10	
Playa Parda Cove-	1 8			Tictoc Bay -	1 45	11	
Port Tamar -	3 5	5		<i>Chonos Archipelago.</i>			
Valentine Harbour	2 0			Port Otway -	11 37	6	
Harbour of Marcy-	1 22	4		San Andres Bay -	0 45	5	
Cape Pillar -	1 0			Port San Estevan	0 15	5	
<i>Smyth, Sarmiento, Wide, and Messier Channels.</i>				Anna Pink Bay -	0 45	5	
Goods Bay -	0 30	7		Vallenar Road -	0 18	5	
Fortune Bay -	0 50	7		Port Low -	0 40	7	
Welcome Bay -	0 50	7½		<i>Chiloe Archipelago.</i>			
Puerto Bueno -	1 40	8½		Huafu Island -	12 0	7	
Guia Narrows -	2 10	8		Cucao Bay -	12 0	6	
Fury Cove -	1 15			Port San Carlos, }	11 15	6	
Eden Harbour -	12 30	5		Town - }			
Halt Bay -	0 30	8		Port San Carlos }	0 14	6	
Middle Island -	12 0			Pt. Arenas - }			
<i>Tierra del Fuego, S.W. Coast.</i>				" English }	0 4		
Cape Horn -	4 40	9		Bank - }			
St. Francis Bay -	4 0			Caremapu -	0 50	10	
St. Martin Cove -	3 50	8		Petucura Rock -	0 50	16	
Middle Cove -	3 30			San Pedro Passage	0 30	9	
Goree Road -	4 0	8		Huildad Inlet -	0 48	16 - 20	
Lennox Cove -	4 40	8		Quelan Cove -	0 28		
Nassau Bay -	4 0	6		Talcan Island -	1 3	15½	
Good Success Bay	4 3	6-8		Alan Island -	0 31	18	
Packsaddle Bay -	3 30	6		Poqueldon Harbour	0 54	18	
Orange Bay -	3 30	5		Castro -	0 11	18	
New-year Sound -	3 30			Dalcabue -	0 26		
Adventure Cove -	3 10	4		Changues Islands -	0 35		
March Harbour -	3 10	6		Quicavi Bluff -	0 57	20	
Doris Cove -	3 0	4		Oscuro Cove -	0 55	20	
Stewart Harbour -	2 50	4		Lobos Head -	0 29		
Townshend Harbour	2 30	5		Compu Inlet -	1 10	17	13½
Fury Harbour -	2 30	4		Cullin Island -		20	
North Cove, Fury }	2 30	4		Huapilinao Head -	1 25	15½	
Island - }				Reconlavi Inlet -	0 44	14	
Hewett Bay -	0 30	6½		Puluqui Island -	1 5		
Bedford Bay -	0 30	7½		Calbuco Fort -	1 18 or 0 47	18	
Smyth Harbour -	12 0	6½		" Beach -	1 15	16	
Noir Island -	2 30	5		Abtao Island -	0 50	18	
Laura Harbour -	1 0	6		Tres Cruces Point-	1 15	16	
Cape Castlereagh -	2 50	4		Chacao Bay -	0 40	14	
Cape Gloucester -	1 30	5		" Narrows -	1 15	16	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Chile.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Coyhuin River -	0 52	21		Guayaquil -	7 0	11	
Port Valdivia -	10 35	5		St. Elena Bay -	1 18	8	
Mocha Island -	10 30			Salango Id. -	0 41	12	
Leubu River -	10 30	5		Port Manta -	3 4	6	
Santa Maria Island -	10 20	6		Caracas River -	3 30	10	
Arauco Bay -	10 15	6		Cape Pasado -	3 30	10	
Talcahuano -	10 14	5		Atacames Bay -	3 37	13	
Maule River -	10 0	5?		Santiago River -	3 30	13	
Toro Point -	9 45			Tumaca Road -	2 33	12	
Valparaiso -	9 32	5		Sanguianganga (en- trance) - }	4 10	9	
Juan Fernandez } Island - }	9 30	4		<i>Galapagos Islands.</i>			
Pichidanque Bay -	9 20	5		Charles Island -	2 10	6	
Port Herradura -	9 8	5		Albemarle " -	2 0	6	
Coquimbo Bay -	9 8	5		Chatham " -	2 23	6½	
Port Huasco -	8 30	6	4	Indefatigable " -	1 56	6	
Copiapo -	8 30	5		James, I., West-end -	3 10	5	
Port Flamenco -	9 10	5		" N. side -	2 34	5	
Lavata Bay -	9 20	5		" Adam Cove -	2 14	5	
Grande Point -	9 45	5		Tower Id. -	?	?	
Paposo -	9 40	5		Culpepper Id. -	?	?	
<i>Bolivia.</i>				Wenman Isles -	2 10		
ConstitucionCove, } Moreno - }	10 0	4		<i>New Granada and Veragua.</i>			
Port Mexillones -	10 32	3		PortBuenaventura } (Negrilla Reef) }	4 0	13	
Cobija Bay -	9 54	4		" off the Town -	6 0	13	
Paquique or San } Francisco Point }	9 45			San Juan River -	6 0	12	
<i>Peru.</i>				Cabita Bay -	3 40	12	
Iquique Road -	8 45	5		Port Utria -	4 0	12	
Lobo Point -	8 0			Cupica Bay -	3 30	13	
Arica Road -	8 0	5		Octavia Bay -	3 30	13	
Ylo Road -	8 15	6		Pinas Bay -	3 15	14	
Islay -	8 53	7		Chepo River -	3 40	16	
Quilca River -	8 0	6		Pedro Gonzales, } (Trapichi Id.)- }	3 50	16	
Point Lomas -	8 19	5		Chamé Bay -	4 0	16	
Atico Road -	8 53	5		Saboga -	4 0	14	
Port San Juan -	5 10	3		Panama Road -	3 23	15 - 22	10-16
" San Nicholas -	5 15	3		Port Nuevo -	3 10	12	
Independencia Bay -	4 50	4		Parida Island -	3 15	10½	
Pisco Bay -	4 50	4		<i>Central America, West Coast.</i>			
Callao Bay -	5 47	4		Nicoya Gulf (Port Herradura) -	3 9	10	
Huacho Bay -	4 45	3		Port San Juan del } Sur - }	3 8?	10?	
Supé Bay -	4 50	3		Port Realejo -	3 6	11	
Guarmey Bay -	6 10	2		Port la Union, } G. of Fonseca - }	3 15	10½	8½
Samanco or } Guambacho Bay }	6 30	2		Acajutla Road -	2 25	9	
Port Malabrigo -	5 0	2		<i>Mexico, West Coast.</i>			
Lambayeque Road -	4 0	3		Port Guatulco -	1 30	5	
Port Payta -	3 20	3		" Sacrificios -	3 15	6	
Malpelo Point -	4 0	10		Acapulco -	3 6	1½	
<i>Ecuador.</i>				Perula Bay -		7	
Sta. Clara Island -	4 0	11					
Morro, Sandy Point of -	5 0	11					
Puna Island -	6 0	11					

Place.	High Water, Full and Change.	Range.		Place.	High Water, Full and Change.	Range.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Nootka Sound, }	12 0	12		Sitka* - -	0 34	5-7	
Vancouver Id. }	12 0	12		Behring Bay -	0 30	9	
Hesquiat Harb. „ -	12 0	12		Port Etches -	1 15	9½	
Barclay Sound, }	12 0	12		„ Chalmers -	1 0	13½	
Island Harbour }	12 0	12		„ Chatham -	1 0	12	
Clayoquot Sound -	12 0	12		Ounalashka Island	7 30	7½	
				Cape Roshnoff -	7 30	15	
				Good-news Bay -	6 15	13½	
				Golovnin Bay -	6 23	3½	
				Port Clarence -	4 25		
				Chamisso Island -	4 42		
<i>America, North West Coast.</i>							
Duncan Bay, }	12 0	21					
Chatham Sound }							
Port Kuper -	1 40	13	10½				
Port Simpson -	0 35	21½	14½				
Portland Inlet, }	1 8	16					
(Salmon Cove) }							

* The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation (1862), the local pilots say that the rise sometimes is as much as 16 feet.

T I M E

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PLACES GIVEN IN THE PRECEDING PAGES;

ARRANGED ALPHABETICALLY;

*With the Rise of the Tide at Springs and Neaps.**

When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Abaco, Bahamas - -	8 0	3		Agadir, or Santa Cruz, Africa.	12 45	9	
Abbey Head, England -	11 10	23	17½	Aggerminde, Jutland -	4 9	2	
Ab-ul Kuri, Indian Ocean	8 30	6		Agnes, St., Scilly Isles -	4 30	16	
Aberdeen, Scotland - -	1 0	12	10	Agoda Pnt., Hindoostan, W. Coast.	10 30	9	
Aberdovey, Wales - -	8 0	15		Agulhas Cape, Africa, S. Coast.	2 50	6	
Aberwrach, France - -	4 14	22	16	Air Point, River Dee, England.	10 54	25	19
Aberystwyth, Wales -	7 31	13½	10	Aix, Ile d', Charente R., France.	3 20	17	12½
Abrolhos, Brazil -	3 20	6-7		Akaroa Harb., New Zea- land.	3 24	8	6
Abtao I., Patagonia, V.V.C.	0 50	18		Akasi, Japan Sea -	6 36	6½?	
Abu-aher, Persian Gulf	7 30	7		Akyab, Aracan R., Bay of Bengal.	9 45	9	6
Acajutla, Central America	2 25	9		Al Bidā, Persian Gulf -	8 30?	6?	
Acapulco, Mexico, W. Co.	3 6	1½		Alabat Harbour, Luzon -	10 0	9	
Acheen Head, Sumatra -	8 45	8		Alan Island, Patagonia, W. Coast.	0 31	14	
Achillbeg, Ireland - -	5 14	10½	8	Albany Ids. (Port Albany) Australia, E. Coast.	12 15	10	7
Adam Bay, Australia, N. Coast.	6 0	18		Albemarle Id., Galapagos	2 0	6	
Adams Port, (Mary Id.) Yellow Sea.	2 0	10		Port, Falkland	7 15	7	
Adehide Port, Australia, S. Coast.	5 44	6		Islands.			
Aden and adjacent Bays, Arabia, S. E. Coast.†	{ 7 30 to 9 30 }	7	4½	Albert River (Kangaroo Point) Australia, N. Coast.	7 30	10-13	3-8
Admora, Flores, Malay Archipelago.		8		Aldabra Ids., Mozambique	5 0	10	
Admiralty G., Australia, N.W. Coast.	12 0			Aldborough, England -	10 45	8?	6½?
Adolphus Id., Australia, N.W. Coast.	7 30	11		Alderney, English Chan-	6 46	17	12½
Adon Atoll, Maldives -	1 0	11		Alert Bay, Cormorant Id., Johnstone Strait, Vancouver Id.		15	
Adon Matte Atoll, Mal- dives.	3 0	4		Alexander Port, Africa, S.W. Coast.	3 0	5	
Adventure Cove, Tierra del Fuego.	3 10	4					
Port, New Zealand.	12 20	8	6				
Sound, Falk- land Islands.	5 30	5½					

* By the Rise of the Tide is meant its vertical rise above the mean low-water level of Spring Tides.

† From a Survey of Aden Anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but, according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Algeçiras, Spain -	1 49	4	2½	Antonio St. Port, Magellan Strait.	12 0	7	
Algoa B., Africa, S. Cst.	4 0	4-5		Antrobus Id., G. St. Lawrence.	10 30	5	
Alligator Rvr. Australia, N. Coast.	8 15	15		Antwerp, Belgium - -	4 25	15	
Alloa, Firth of Forth, Scotland.	3 18	17½	15	Aor Pulo, Sumatra, N.E. Coast.		5	
Altona, Germany - -	5 19	7		Aotea Harb., New Zealand	10 0	12	
Amboyna, Moluccas -	0 33	7		Apalachicola B., Gulf of Mexico.		2½-4	
Ameland Gat, Netherlands	9 0	7		Appetetat B., Gulf St. Lawrence.	11 10	5?	3?
— Hollum Rd., „	11 30	7		Appin Port (Loch Linnhe), Scotland.	5 26	12½	8½
Amet Sound, Nova Scotia	10 30	8	5	Appledore, England -	5 28	23	10
Amiranté Isles, (St. Joseph Id.) Indian Ocean.	5 0	8½		Aquin Bay, St. Domingo	irr.	2-3?	
Amlwch, Wales - -	10 30	18?	13?	Aracan R. (Bar), Bay of Bengal, E. Coast.	9 45	9	6
Amoy (Inner Harbour), China, East Coast.	12 0	18½	14½	Aracati, Brazil - -	6 0	8	6
Ampanam B., Lombok -	8 0	6		Araish El, Africa, N. Cst.	1 30	9-12	
Amsterdam, Indian O. -	11 0	3		Arasaig, Scotland - -	5 50	13½	10
Amulgawein, Persian G.	11 40	6		Arauco Bay, Chile - -	10 15	6	
Amur Strait, G. of Tartary	11 40	5-6		Arbroath, Scotland - -	1 35	14	10
Andaman Ids., Port Blair, Indian Ocean.	10 0	9	6	Arcachon, France - -	4 37	11½	
— Port Cornwallis	10 0	8½		Arcas Rks. G. of Mexico	noon	1½	
— Strait, Indian Ocean.	10 24	9½		Ardglass, Ireland -	11 0	16	
Andrava Bay, Madagascar.	3 30	7		Ardintallan, Loch Feochan, Scotland.	5 31	9	
Andres, San B., Patagonia, W. Coast.	0 45	5		Ardrishaig, Loch Fyne -	11 53	9	
Andrews, St., Bay, G. of Mexico.	irr.	1-2		Ardrossan, Scotland -	11 45	10	
Anegada, Virgin Islands	9 0	1½		Arenas Pt., San Carlos, Patagonia, W. Coast.	0 14	6	
Aneiteum, Inyang, S. Pacific.	6 35	4		Argyle, Bay of Fundy -	9 27	12½	10
Angoxa River, Africa, E.C.		13		Arica Road, Peru - -	8 0	5	
Angra, Azores - -	12 32	4½		Arichat, Nova Scotia -	8 10	5	
— Bank, Hindoostan, W. Coast.	10 30	9		Arinagour, Coll Id., Scotland, W. Coast.	5 39	12½	
— Pequena, Africa, S.W. Coast.	2 30	8		Arkangel, White Sea -	7 28	2½	
Anna Pink B., Patagonia, W. Coast.	0 45	5		Arklow, Ireland - -	8 45	4	
Annan Foot, England -	11 56	20	14	Arnhem B., Australia, N.C.	8 10	6	
Annapolis, United States	4 38	1	1	Arroa, Malacca Strait -		10	
Anne, St. B., Cape Breton	8 34	6	4½	Arthur Port, Tasmania -	7 52	4	
Annisquam, United States	11 0	10½	9	Arundel, England -	12 25		
Anno Bom Id., Africa	8 45	5		— (Bar) - -	11 35	16	11
Anticosti Id., G. St. Lawrence, East Cape -	1 0	5	3	As Rocas, S. Atlantic -	5 15	10	
„ Bear Bay -	1 10	5	3	Asaph St., B., Australia, N. Coast.	5 45	14	
„ West Point -	2 0	6	4	Ascension Id., S. Atlantic	5 30	2	
Antigonish Harb. R. St. Lawrence.	9 0	4	2	Askaig Port, Islay -	4 58	6½	
Antigua Id. (English Harb.), Caribbean Sea.		2		Astoria, Oregon -	0 42	7½	
Antongil Bay (Port Choiseul), Madagascar.	4 0	5		Atacames Bay, Ecuador	3 37	13	
Antonio Cape St., Cuba		1½		Atchafalay Bay, G. of Mexico.	irr.	2-2½	
Antonio St. Port, Patagonia, E. Coast.	10 40	28		Athline, Loch Seaforth -	6 16	15	
				Atico Road, Peru - -	8 53	5	
				Auckland Harb., New Zealand, N. Island.	7 5	11	
				Augustine St., U. States	8 21	5	
				— St., B., Madagascar, W. Coast.	4 30	15	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Atezavick Sound, Labrador.		5		Bander Gorí, Gulf of Aden	8 45		
Alex Cayes Bay, St. Domingo.	irr.	2-3?		——— Sháab, Ind. Ocean	7 0	7	
Avacha B., Kamchatka -	3 30	6½	4½	——— Feikam, Arabia,	10 0	8½	
Avon Isles, Australia, E.C.	8 30	5		S.E. Coast.			
Avon River, Bigbury Bay, England.	5 47	16½	11½	Banff, Scotland - -	0 28	10½	8
Awajima (Inland Sea) Japan.	0 14	7		Bantam, Java - -		5	
Awani R., New Zealand	7 44	7		Bantry Harb., Ireland -	3 47	10	7½
Azim, Africa, W. Coast.	4 30	4		Baracoa, Cuba - -	7 23	2½	
Aylen Bay, Yellow Sea	2 30	6	4	Barataria Bay, Gulf of Mexico.	irr.	1½	
Ayman, Persian Gulf -	11 20	6		Barbados, Caribbee Ids.	irr.	2	
Ayr, Scotland - -	11 50	8½	7½	Barbara Port, Patagonia, W. Coast.	12 28	6	4
—— Point of, I. of Man	11 7	20?	16?	——— I. Santa, California	8 0	3½	
Bab-el-Mandeb, G. of Aden	12 0	7		Barbe St., Sumatra, N.E. Coast.	6 0	6	
Bachelor River, Magellan Strait.	1 40	5		——— Sta. Id., California	8 0	3½	
Becut B., China Sea, E.C.	10 0	6		Barclay Sound (Island Harbour), Vancouver Island.	12 0	12	
Bela Id., Linga Bay, Sumatra.*	6 0 PM	12		——— Uchucklesit Harbour, Vancouver Id.		12	
Belong B. (S. Cst.), Baly	11 0	9½		Bardsey Id., Wales -	7 40	15	
Begroo River, Sherbro River, Africa.			11	Barfleur, France - -	8 51	17	13½
Bahia, Brazil - -	4 15	8		Barmouth, Wales - -	7 41	17	13½
Bahrain, Persian Gulf -	5 30	7		Barnstable, United States	11 22	10	8½
Batavia Id., China Sea, E. Coast.	11 0	5		Barnstable Bar, England	5 30	19	14
Batle Harb., New Caledonia.	6 30	4?		Barnstable Bridge, England.	6 28	10½	7½
Bambangan Id., Borneo, N. Coast.	10 0	6-8		Barquero (entrance), Spain, N. Coast.	3 0	15	
Basore R., B. of Bengal, W. Coast.	10 0	15		Barra, Id. (North Harbour), Scotland, W. C.	5 48	11½	8½
Ballygann, Ireland -	10 40	11		——— Castle Bay, Scotland, W.C.	5 44	11½	8½
Bald Head, United States	7 26	5	4½	Barracouta Harb., G. of Tartary.	10 0	3½	
Balachulish (Loch Leven), Scotland.	5 43	11		Barragan Bay, Rio de la Plata.†	7 0	5-9	
Ballynacourty, Dungarvan, Ireland.	5 12	12½	9½	Barren Id., China Sea, E. Coast.	9 30	5½	
Ballyniskellig Bay, Ireland	3 40	12	7½	Barren Ids., Madagascar	4 45	12	
Ballycastle B., Ireland -	6 25	3	2	Barrow Harbour, Newfoundland.	7 10?	5?	
Ballycotton, Ireland -	4 54	12	9½	Barry Id., Wales -	6 39	35½	26
Ballycrovane, Kenmare River, Ireland.	3 42	10½	7½	Barton Port, (Bubon Point), China Sea E.C.	10 55	6	
Ballymakill Bay, Ireland	4 40	12½	9½	Bas, He de, France -	4 49	23	17
Ballyness (Bar), Ireland	5 22	11½	8½	Básidúh, Persian Gulf -	12 0	10	
Ballysodare (Quay), Ireland.	6 0	8½	5½	Basil Bay, Korea, W. C.	4 15	18	10
Ballyshannon (Bar) -	5 18	11½	8½	Basque Port, Newfoundland.	8 55	5½	3½
Ballyweel, Ireland -	5 23	12½	8	Basrah (Bar), Persian Gulf	12 0		
Bann, Scotland - -	9 45	6	4½	——— Town - -	6 0?	9?	
Bannmore, Ireland - -	4 23	10½	8½	Bassein R., Bay of Bengal.	10 0	9	6
——— United States	6 33	1½	1½	Batanes, Bashee Islands, China Sea, E. Coast.		4	
Banana Ids., Africa, W.C.	8 15	9		Batavia, Java - -	10 0	2	
Banzoot R., (entrance) Hindoostan, W. Coast.	2 0	12		Batchian, Gilolo, Moluccas	1 0	6	
Banda, Moluccas -	4 0	6?					
Bander Alúleh, G. of Aden	6 45	6					

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Cruising Brig Saracen.

† In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bate (Gulf of Cutch), Hindoostan, W. Coast.	12 20	12	8	Berbice, Guayana -	4 30	11?	
Bathurst, G. St. Lawrence	3 15	7	4	Bergen, Norway - -	1 30	4	
Bathz, Netherlands -	3 15	15		Berkeley Sound, Falkland Islands.	5 0	7	
Batiscan, R. St. Lawrence	9 48	3½	2	Bermudas: Ireland Id., N. Atlantic.	7 14	4	
Batticalao River, Ceylon	5 0	2-3		Bernera, Loch Roag, Lewis Id.	6 11	11	8
Bawdsey Haven (see Woodbridge Haven).				Berneray I., Sound of Harris.	6 11	13	9½
Bay of Harbours, Falk- land Islands.	6 0	5		Bersiap Point, Banka Strait.	6 30	12	
Bay of Islands, (Motu Mea Islet,) New Zealand.	7 15	9	6	Bersimis R., Gulf St. Lawrence.	2 0	12	7
Bay of Mercy, Banks Land		2		Berwick, Scotland -	2 18	15	11½
Bayonne (Bar), France -	3 45	12	10	Betcheween Harb., G. St. Lawrence.	11 32	5	3
Bazaruto Cape, Africa, E.C.	4 15	10		Beypoor R. (entrance), Hindoostan, W. Cst.	0 15	5	
Beachy Head, England -	11 20	20	15	Bias Bay (Tooniang Id.,) China E. Coast.	8 0		
Beagle Bay, Australia, W. Coast.	11 30	13-15		—— (Tsangchow Id.) China, E. Coast.	8 30		
Bear Cape, Prince Edward Island.	9 0	6	3	Bic Id., G. St. Lawrence	2 15	14	8½
Bear Head, C. Breton Id.	8 30	4½	3	Biddah R., B. of Bengal, W. Cst.	10 0	14	13
Beaubère Id., Gulf St. Lawrence.	6 30	6	4	Bideford, England -	6 7	16	
Beaufort, United States -	7 26	3½	2½	Bijouga Islands, Arcas Channel, Africa, W. Cst.	10 10	11-14	9
Beaulieu, England -	{ 10 25 12 15 }	{ 10 21½ }	{ 8½ 16½ }	—— Bissao, Africa, W. Cst.	11 0	8	
Beaumaris, Wales -	10 32	15		—— Orango Channel, Africa, W. Cst.	10 0	11	
Beaver Cove, Vancouver Island.				Bilbao (Bar), Spain -	3 0	13	
—— Creek, Loughbo- rough Inlet, B. Columbia.	3 0	16	11½	—— (Town), „ -	3 20	9	
—— Harbour, Van- couver Island.	0 30	15¾		Biloxi, G. of Mexico -	irr.	2	
—— Nova Scotia -	7 40	6½	4½	Bima Bay, Sumbawa -	Noon.	6	
Bedeque Harbour, Prince Edward Island.	10 15	7	5	Binkang B. China Sea, W. Cst.	11 30	5	
Bedford Bay, Tierra del Fuego.	0 30	7½		Binnic, France - -	6 3	30	22
Behring Bay, America, N.W. Cst.	0 30	9		Bintula R., China Sea, E. Cst.	5 45	6	
Belfast, Ireland - -	10 43	9½	8	Bird Island, China Sea, E. Cst.	9 30	6	
Belgrano Port, La Plata	6 0	12	10	—— Ids., Africa, S. Cst.	4 0	4-5	
Bell Sound, Spitzbergen	8 56	3½		—— Id. Light, United States.	7 59	5½	
Belles Amour B., Labrador	9 0	4½	2½	Blaavand Point, Jutland	1 44	5	
Belligam Bay, Ceylon -	2 20	2½		Black Ball Harb., Ireland	3 40	9½	
Bellona Reefs (Middle), Australia, E. Coast.	8 30	6		—— Rock, Bay of Fundy	11 29	36	31
Bembatooka Bay, Mada- gascar, W. Cst.	4 30	16		Blacksod Bay (Quay), Ire- land.	4 47	10	
Bembridge Pt., England	11 0	14	10½	Blacktoft, River Humber	6 59	16	
Benbecula, Scotland -	6 3	11½	8½	Blair Harb., China Sea, W. Cst.	8 50	9	
Bencoolen, Sumatra -	6 0	3-5		Blakeney, England -		9	
Benevente, Brazil -	3 0	5		—— (Bar) „	6 30	15	
Benguela, Africa, W. Cst.	2 30	5?		Blanche Port, Streaky Bay, Australia, S. Coast.	1 0	5	
Benin R., Africa, S. Cst.	4 30	7		Blankenberg, Belgium -	12 48	13	11
Benton Castle, Cleddau River, Wales.	6 23	20	14½				
Berbereh or Barburra (Gulf of Aden) Africa, E. Cst.	7 15	9					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Raccoon Cape, Africa, W. C.	11 46	6		Braha Harbour, New-	7 0?	2-3?	
San, Mexico, W. Cst.	9 41	6½		foundland.			
— La Plata -	2 0	12	10	Bramble Cay, Torres Strt.	9 15	12	
Basket Islands, Ireland -	3 30	11½	8	Brandy Pots, River St.	3 0	17	10
Bayfields, Mosquito Coast	1 50	2		Lawrence.			
Bay Sound, New Zea-	10 45	8	6	Brass River, Africa -	4 0	6	
land.				Brava, Africa, E. Cst. -	4 30	8	
Bed Bay, Nova Scotia	7 46	7½	6	Bray Head, Ireland -	10 45	12	9½
Beck Id., United States	7 36	3½	2½	Brazos River, G. of Mexico	irr.	1½	
Beef Cay, Bahamas -	7 0	4½		Bréhat, France - -	5 51	31	23½
Beef Harb., New Zealand	1 18	8	6	Brest, France - -	3 47	19	13½
Borden Harbour, Brit.	12 0	16	11½	Bridgeport, United States	11 11	8	6½
Columbia.				Bridgewater (Bar) England	6 50	35	26½
Byth, England - -	3 15	15	11	Bridlington, England -	4 39	16	12
— R., Southwold,	10 20	6½	4½	Bridport, England -	6 5	11½	7½
England.				Brielle, Netherlands -	3 0	5	
Bay de Varadero, Cuba	8 39	2		Brighton, England -	11 15	19½	16
Belga Port, California	11 17	4½	3½	Bristol (King Road) Eng-	6 56	44	33
Bellin Light, United	5 42	1½	1	land.			
States.				Britannia Bay, Sumbawa	1 0	11-12	
Beckor Cape, Africa -	12 0	8?		British Sound, Mada-	4 0	9½	
Beck Head, England -	5 45	15?	11?	gascar, E. Cst.			
Beckley Dockyard, Hin-	11 40	12-17		Broad Sound, Australia,	11 0	20-30	
doestan, W. Coast.				E. Cst.			
Bonaca Id., Bay of Hon-	9 0	1½		Broadhaven Har., Ireland.	5 0	10½	7½
duras.				Broadway R. (entrance),	11 0	7½	
Bonanza, Spain - -	2 0	12½	8	China, E. Coast.			
Bonne Esperance Harb.,	9 15	5	2½	Broken Bay, Australia,	8 0	6-9	
G. of St. Lawrence.				E. Coast.			
Bony R. C., Africa, Wst.	5 0	9		Broom Loch (Ullapool)	6 40	14½	10½
Bony Island, Australia,	4 30	8		Broughty Ferry, Scotland	2 22	14½	11
N. Coast.				Brouwershaven, Nether-	2 15	10	8
Bordeaux, France -	6 50	14	12½	lands.			
Bos B., Magellan Strait	1 50	6½		Bruit River, Borneo -	3 0	11	
Braam (Road) Germany	10 30	8-10		Bruni R., China Sea, E.	11 0	12	
Breastle, England -	5 15	25	17½	Coast.			
Boston (Sluice), England	7 0	12		Brunsbittel, Germany -	1 58	9	
— Deep (Clay Hole) „		21½		Brunswick B., Australia,	12 0	24	
— Hob Hole „ -		17		N.W. Cst.			
— (Charlestown Naval	11 27	11½	10	Brush, Yarmouth, England		5½	4½
Yard) United States.				Bubon Point, Port Barton,	10 55	6	
— Light, United States	11 12	11	9½	China Sea, E. Coast.			
Bony Bay, Australia, E.	8 15	7-8		Buctouche River, G. St.	3 30?	4?	2½?
Cst.				Lawrence.			
Bouler R., Madagascar -	4 30?	15?		Budehaven, England -	5 45	23	17
Boulogne, France - -	3 39	8½	6	Buenaventura Port, Cen-	4 0	13	
Boughton Harb., Prince	8 40	5	2½	tral America (Negrilla			
Edward Island.				Reef).			
Boulogne, France -	11 25	25	19½	„ off the town -	6 0	13	
Bourbon Id., Indian Ocean, see Reunion Id.				Buenos Ayres, S. America,	12 0	3-5	
Bouy (Cajeli Bay) Mo-	1 0	6		E. Coast.*			
rocas.				Buffalo R. (entrance),	3 45	4½	
Bow Island, S. Pacific -	2 40	3		Africa, S. Cst.			
Bowen Port, Australia, E.	9 35	16		Bulama Island (Arcas	10 10	14	11
Cst.				Channel), Africa, W.			
Bowling, R. Clyde, Scot-	0 39	9		Coast.			
land.				Bull Harbour, Goletas	0 30	12½	
Bouanna B., Madagascar,	4 30	15		Channel, Vancouver Id.			
W. Cst.				Bull Id., Newfoundland	7 22	3½	2
Bradore Bay, Labrador -	8 45	4	2	Bulls Id. Bay, United States	7 16	5½	4½

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bulls Mouth (Achill Sound, N. entrance), Ireland.	5 38	10 $\frac{3}{4}$	7 $\frac{1}{2}$	Calshot (Castle Pt.), England.	11 30	13	9 $\frac{1}{2}$
Bulsaur R., Hindoostan, W. Cst.	1 45	18		Calstock, R. Tamar, England.	6 6	12 $\frac{1}{2}$	8 $\frac{1}{2}$
Buluagan O'sta Ans Port, Filipinas.	12 0	5 $\frac{1}{2}$		Camaguin, Babuyan, Islands.	6 0	6	
Bunawe (Loch Etive), Scotland.	7 54	5 $\frac{3}{4}$		Camariñas Port, Spain -	3 0	15	
Buncranna, Ireland -	5 40	16		Cambay, Hindoostan, W. Coast.	5 20	28	
Bunessan, Scotland -	5 24	12	8 $\frac{1}{4}$	Cambing, Banda Sea, noon		6	
Burburra, see Berberch.				Camden Harb., Australia, N.W. Coast.	11 30	30	
Burin Harbour, Newfoundland.	8 45	6 $\frac{1}{2}$	4 $\frac{1}{2}$	Cameleon Harb., Nodales Channel, B. Columbia.	3 0	16	11 $\frac{1}{2}$
Burntisland, Firth of Forth, Scotland.	2 24	16 $\frac{1}{4}$	12 $\frac{3}{4}$	Cameroon R., Africa, W. Coast.	4 0?	6	
Burnt Isles, Kyles of Bute, Scotland.	11 50	10	8	Campbell Cape, New Zealand.	6 0	8	6
Burong I., China Sea -	4 45	7		—— Island, South Pacific.	12 0	43?	
Burrard Inlet, Gulf of Georgia, B. Columbia.	6 0	16		—— Town, Gulf St. Lawrence.	4 0	10	7
Burry Port, Wales -	6 1	25 $\frac{1}{4}$	18 $\frac{1}{2}$	Campbellton, Scotland -	11 45	8 $\frac{1}{2}$	6
Bushire, see Abú-shehr.				Campeche, Yucatan -	1 45	2 $\frac{1}{2}$	2
Bussorah R. Bar, Persian Gulf.	12 0			Campobello (Welchpool), B. of Fundy.	11 21	23 $\frac{1}{2}$	20
Busuanga, Burias Island	12 30	6		Cancale, France -	6 20	87	27
Button Islands, Hudson Strait.	6 50			Canna Id., Scotland, W. Coast.	6 19	14	9 $\frac{1}{2}$
Byron Bay, Australia, E. Coast.	9 45	6		Canso Gut (Plaister Cove), Nova Scotia.	9 10	4 $\frac{1}{2}$	3
—— Cape, Australia, E. Coast.	9 45	6		—— Har., C. Breton Island.	7 48	6 $\frac{1}{2}$	4 $\frac{1}{2}$
Cabifa Bay, New Granada.	3 40	12		Cantin Cape, Africa -	10 0	10	
Cacheo River, Africa, W. Coast.	7 45	8		Canton River (entrance), China.	10 0	8	
Cadiz, Spain -	1 45	9 $\frac{1}{2}$		Canton River } In Mar.	2 40	5 $\frac{1}{2}$	
Caen, France -	10 57			(Kuper Id.) } In May			
Caermarthen (Bar) -	6 10	26	19 $\frac{1}{2}$	—— " } & June	1 40	5 $\frac{1}{2}$	
Caernarvon, Wales -	9 33	13 $\frac{3}{4}$	10 $\frac{1}{2}$	Cape Coast Castle, Africa, W. Coast.	4 30	6	
Calmitas, St. Domingo -	8 0?	1?		Cape May Landing, U.S.	8 19	6	5
Cairnlough, Ireland -	10 51	5 $\frac{1}{4}$	5	Caracas River, Ecuador -	3 30	10	
Cajeli Bay, Bouro -	1 0	6		Carquette Harbour, G. of St. Lawrence.	2 40	6	3
Calais, France -	11 49	19 $\frac{1}{2}$	15 $\frac{1}{2}$	Cardiff, Wales -	6 59	38	29
Calbuco Beach, Patagonia, W. Coast.	1 15	16		Cardigan, Wales -	7 1	12	9
Calcasieu Fort, Patagonia, W. Coast.	{ 1 18	18		—— Bay, Prince Edward Island.	8 40	5	3 $\frac{1}{2}$
—— River, Gulf of Mexico.	{ 0 47			Careening Bay, Australia, N. W. Coast.	11 45	30	
Calcutta, Bengal -	2 30			Caremapn, Patagonia, W. Coast.	0 50	10	
Caldy Island, Bristol Channel.	6 0	24?	16?	Cargados Garayos Shoals, Indian Ocean.	2 0	4	
Calebar R., Africa, W. Cst.	5 0	9		Cargreen, R. Tamar, England.	5 47	14 $\frac{1}{2}$	10 $\frac{1}{2}$
Caledonia Harbour, New Granada.	11 40	1 $\frac{1}{4}$	1	Caribou Harbour, Nova Scotia.	10 0	6	4
Calf Sound, Isle of Man.	11 17	16 $\frac{1}{4}$	13				
Calicut Roads, Hindoostan, W. Coast.	0 15	5					
Callao Bay, Peru -	5 47	4					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Varleton Point, Gulf St. Lawrence.	3 0	6	4	Cedeira, Spain, N. Coast	3 0	15	
Wallingford (Bar or Cranfield Point), Ireland.	11 0	14	11	Centre Id., (Foveaux St.) New Zealand.	12 15	8	6
Wisle Port, England -	12 10	20	14	Ceram, Wahaay Harbour, Moluccas.	6 0	3	
San, Port, Patagonia, W. Coast.	11 15	6		Cerros Id., California -	9 10	7-9	
— (Arenas Point) Patagonia W. Coast.	0 14	6		Ceuta, Africa, N. Coast -	2 6	3½	½
— (English Bank) Patagonia W. Coast.	0 4			Chacachacara Id., Trinidad, Caribbean Sea.	3 30	4	
San, Port, Falkland Islands.	7 0	8		Chacao Bay, Patagonia, W. Coast.	0 40	14	
Arnot Bay, Australia, W. Coast.	0 30	13-14		— Narrows, Patagonia, W. Coast.	1 15	16	
Orange River, R. St. Lawrence.	7 15	16	11	Chalky Inlet, New Zealand.	11 5	8	6
Trigabolt, Ireland -	4 44	14	10½	Chalmers Port, America, N. W. Coast.	1 0	13½	
Wraig, Scotland -	5 28	10	7½	Chamé Bay, New Granada.	4 0	16	
Cartagena, New Granada	11 0	1½	1	Chamisso Id., America, N. W. Coast.	4 42		
Genet, France -	6 25	31	22½	Champion Bay, Australia W. Coast.	9 10	1	
— Port, New Ireland.		6		Champlain R., St. Lawrence.	9 45	3	2
Arvar or Sedashigur Bay, Hindoostan, W. Coast.	10 0			Changchi Id., China, E.C.	9 30	17	
Acumpeque H., Prince Edward Island.	5 40	3	2	Changues Ids., Patagonia, W. Coast.	0 35		
Ashtla Bay, Ireland -	4 33	16	12	Chapu Road, Hang-chu Bay, China, E. Coast.	12 0	25	
Asqueta, English Channel	6 45	15½		Charles Cape, United States.	7 45	5	
Castillos, Cape, Rio de la Plata*	8 30	2		Charles Id., Galapagos -	2 10	6	
Castlereagh Cape, Tierra del Fuego.	2 50	4		Charleston, United States	7 26	6	5
Castletown, Bearhaven, Ireland.	4 14	9½	7½	Charlottetown, Prince Edward Island.	10 45	9½	7
— Isle of Man -	11 10	20	16	Charlowka R., Lapland	8 8	12	
Castletownsend, Ireland -	4 21	10½	8	Chateau Bay, Labrador -	7 35	3½	1
Castries B., G. of Tartary	10 30	6		Chatham, England -	1 2	17½	14
Castro, Patagonia, W. Cst.	0 11	18		— Id., Galapagos	2 23	6½	
Casuarina Point, China Sea, E. Coast.	9 30	6½		— Port, America, N. W. Coast.	1 0	12	
Catalina Harbour, Newfoundland.	7 0	6	4	Chatte Cape, United States	12 0	13	8
Catharina Sta. I., Brazil -	2 45	6	4½	Chauan Bay, China, E. Coast.	11 0	6½	
Cato Bank, Australia, E.C.	8 0	6		Chausey, Isles de, France	6 9	35	26
Catoche Cape, Yucatan -	9 30	1½		Cheduba, Bay of Bengal-	11 30	8	
Cattawade Bridge, Stour River, England.	1 8	4½		Chee-fow Harb., Yellow Sea, see Chifu.			
Chavalli Ids., New Zealand	8 0	7		Chentabun River, China Sea, W. Coast.	10 0	5½	
Chavern Island, China Sea, E. Coast.	9 30	5½		Chepo River, New Granada.	3 40	16	
Chivee Islands, Gulf St. Lawrence.	1 50	9	5	Chepstow, England -	7 30	38	28½
Chay West, United States	9 30	1½	1½	Cherbaniani Reef, Laccadives, Indian Ocean.	10 0	7	4
— N.W. Channel, U.S.	9 10	1½	1½	Cherbourg, France -	7 49	17	12½
Cayenne, Guayana -	3 45	6-11		Chesikton, England -	6 13	10½	7
Cayux, France -	11 5	27½	21	Chester (Crane Wharf), England.	0 16	26	
Ceara, Brazil -	4 30	9					
Cedar Cays, United States	0 51	3½	2½				

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Chester River (Rockhall Creek), United States.	5 23	2½	1	Clonakilty, Bay, Ireland	4 30	11	8½
Chesterfield Islet, Australia, E. Coast.	8 30	5		Coacocho Bay, G. of St. Lawrence.	10 30	5	3
Chetican, C. Breton Id. -	8 15	3½		Cobija Bay, Bolivia -	9 54	4	
Chichester, England -	11 30	14	11	Cocagne River, G. St. Lawrence.	7 30?	4?	2?
Chifu, Yellow Sea -	10 34	8	6½	Cochin Harb. and Road, Hindoostan, W. Coast.	1 0	3½	
Chimmo Bay, China, E. Coast.	10 20	16		Cockburn Port, Africa, E. Coast.	4 15	12	
Chimney Id., Rees Pass, China, E. Coast.	11 30	12		— Australia, N. Coast.	5 45	24	
Chinchu Harb., China, E. Coast.	12 25	17		— Sound, Australia, W. Coast.	9 0	1-1½	
Chin-hae, Yung R., China, E. Coast.	11 20	12½		Cockenzie, Firth of Forth, Scotland.	2 16	15½	13
Ching-tau Bay, Yellow Sea	6 0	12	9	Cod Cape, United States	11 30	13	
Chipiona, Spain -	1 34	12½	8	Codroy Island, Newfoundland.	9 15	6	4
Chittagong (Bar), Bay of Bengal, E. Coast.	1 15	15	10	Colorado River, La Plata	4 0	9	7½
Chodo Id., Korea, W. C.	6 20	12		Colarados, R. La Plata -	3 40	11	
Choiseul Port, Madagascar, E. Coast.	4 0	5		Cold Spring Inlet, United States.	7 32	5½	4½
Chosan Harb. or Tsauliang-hai, Japan Sea.	7 45	7	5	Coleraine, Ireland -	6 24	6½	4
Christchurch, England -	{ 9 0 11 30 }	{ 5 }		Collier Bay, Australia, N.W. Coast.	11 45	36	
Christianstæd, Santa Cruz.	7 30	¾		Colne Point, Colne River, England.	12 0	14	10
Christmas Island, Indian Ocean.	10 0			Colombilla Cay, Pearl Cays, Caribbean Sea.	2 0	2	
Christmas Harbour, Kerguelen Id.	2 0	2		Colombo, Ceylon -	1 0	2	
Chuen-pee Point, Canton River.	2 0	7½		Colonsay (Schallasaig) Scotland, W. Coast.	5 18	11	7½
Chusan Archipelago, (Vernon Channel,) China, E. Coast.	9 40	14		Columbia River, (entr.) America, N.W. Coast.	0 15	7½	
Chusan Tinghae, China, E. Coast.	11 0	12	9	Componee River, Africa, W. Coast.	10 0	15	11½
Circular Head, Tasmania	11 40	9		Compu Inlet, Patagonia, W. Coast.	1 10	17	13½
Clam Point, B. of Fundy	8 27	8½	6½	Concarneau, France -	3 12	13	9½
Clara Sta., I., Ecuador -	4 0	11		Condore, Cochin China -	3 0	4	
Clare I., Ireland -	4 38	12½	9½	Congo River, Africa W. Coast.	4 30	6	
Clarence Port, America, N.W. Coast	4 25			Congoon Bay, Persian G.	7 45	9½	
Clarence Harbour, Long Island, Bahamas.	8 30	4	3½	Conil, Spain -	1 18	11½	7½
Clarke Harbour, Bay of Fundy.	8 40	9½		Conquet Road, France -	3 46	21	15
Clayoquot Sound, Vancouver Id.	12 0	12	7	Constitution Cove, Bolivia	10 0	4	
Clear, Cape, Ireland -	4 0	9	6½	Conway Cape, Australia, E. Coast.	11 0	18	
Clearwater Point, Gulf St. Lawrence.	11 30	5	3	Cook Harb. Newfoundland	7 25		
Cleveland Bay, Australia, E. Coast.	7 30	10-12		Cooper Port, New Zealand.	3 50	7½	5½
Cley, England, N.E. Cst.		5½		Copiapo, Chile -	8 30	5	
Clifden Bay, Ireland, W. Coast.	4 30	13½	10	Coquet Road, England, E. Coast.	3 0	14½	11
Clinch Fort, Fernandina, United States - }	7 53	6½	6½	Coquimbo Bay, Chile -	9 8	5	
				Cordouan Lthse., France	3 37	13½	10½
				Corentyn River, Guayana	5 10	8½	6
				Coringa or Cocanada Bay, Bay of Bengal, W. C.	9 10	4-5	3

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Coringa R. (Bar), Bay of Bengal, W. Coast.	9 0	5		Cumsingmun Harbour, Canton River, China.	12 6	6½	
Corisco Bay (Elobey Isles), Africa, W. Cst.	5 0	7		Cupchi Point, China, E. C.	8 0		
Cork (Penrose Quay), Ireland.	4 58	12½	10	Cupica Bay, New Granada	3 30	13	
Corn Ids., B. of Honduras	1 45	2		Curieuse, Seychelles, Indian Ocean.	5 10	7	
Corner Inlet, S. Australia	11 40	8		Curtis Port, Australia, E. C.	9 40	10-12	
Cornwall, Cape, England	4 35	18?	13?	Cuttyhunk, United States	7 40	4½	3½
Cospach (Loch Aber), Scotland.	5 59	11½		Cutwell Harbour, Newfoundland.	7 0?	2-4?	
Corran (Loch Aber), Scotland.	5 43	12	8½	Cuxhaven, Germany -	1 8	10	
Coranna, Spain -	3 0	15		Cuyler Harb., California	9 25	5	4
Cadres Id. (Prairie Bay), R. St. Lawrence.	4 25	17	10	Cypress Harbour, Sharp Passage, B. Columbia.	12 0	16	11½
Corseulles, France -	9 7	20	15½	Daggs Sound, New Zealand.	11 30	8	6
Courtmacsherry, Ireland	4 36	10½	8½	Dahouet, France -	6 5	32	23½
Coverack, England -	4 35	14½	11½	Dalawan Bay, China Sea, E. Coast.	11 0	5	
Coves (West), England	{ 10 45 11 45 }	{ 12½ 12½ }	{ 9½ 9½ }	Dalcabue, Patagonia, W. Coast.	0 26		
Coy Inlet, Patagonia, E. Coast.	9 30	40		Dalhousie Harb., G. St. Lawrence.	3 10	9	
Coyhuin River, Chile -	0 52	21		Dalkey Island, Ireland -	10 45	13	11
Cozumel, B. of Honduras	8 30	1½		Dalrymple B., Madagascar W. Coast.	5 0	15	
Crane Island, River St. Lawrence.	5 24	17	13	----- Prt., Tasmania	12 5	10	7½
Cranford Bay, Mulroy Bay, Ireland.	8 3	4		Damaun Bar, Hindoostan, W. Coast.	1 30	17	
Crapaud, Prince Edward Island.	10 0	8	6	Dampier Strait, Moluccas		11	
Crighton Harbour, Korea, S. Coast.	9 50	11½	8½	Danes Island, Spitzbergen.	0 24	5½	
Crimon Ids., Java Sea -	8 0	6	5	Danno R., Hindoostan, W. Coast.	1 30	17	
Crinan, Scotland -	4 49	6½	5	Darnley Id., Torres Strait	9 30	12	
Croc Harbour, Newfoundland.	6 30	4½		Dartmouth, England -	6 16	14½	10½
Croisilles Harbour, New Zealand.	9 0	12	8	Darwin H., Choiseul Id., Falkland Islands.	6 30	5½	
Cromarty, Scotland -	11 56	14	11	Darwin Port, Australia, N. Coast.	5 30	17-24	
Cromer, England -	7 0	14½	11	Dauphin Fort, Madagascar	4 30	7	
Crow Harb., Nova Scotia	8 0	6½	4½	De Roompot, North Sea	12 30	12	8
Crowdy Head, Australia, E. Coast.	9 15	5		Deal, England -	11 15	16	12½
Crooked Id., Bahamas -	7 0	2½		Dealy Id., Melville Id. -	1 48	4	
Crookhaven, Ireland -	4 9	9½	8	Deep Harbour, Fife Sound, B. Columbia.	12 0	16	11½
Cucao Bay, Patagonia, W. Coast.	12 0	6		----- Point, Durian Strait	5 0	10	
Cuckolds Point, River Thames, England.	1 45	19?	15?	Deer Sound, Orkneys -	10 30	10	7½
Cuidaff Bay, Ireland, W. Coast.	5 53	8½	6	Delagoa Bay (Port Melville), Africa, S. Coast.	4 30	15	
Culebra or Passage Id., Caribbean Sea.	9 0	1		Delagoa Bay (Portuguese Factory), Africa, S. Coast.	5 20	12	
Cullen Harbour, Fife Sound, B. Columbia.	12 0	16	11½	----- Shefeen Id., Africa, S. Coast.	4 40	12	
Cullin Id., Patagonia, W. Coast.		20		Delaware (Breakwater), United States.	8 0	4½	3½
Culpepper Id., Galapagos	?	?		Delftzyt, Germany -	11 15	8-10	
Cumberland Basin, (Sackville) Bay of Fundy.	11 55	45½	38	Delgado C., Africa, E. C.	4 0	16	11½
				Delhi River, Sumatra -	4 0	8	
				Demerara R., Guayana -	4 45	9	6

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Denham Sound, Sharks Bay, Australia, N.W. Coast.	12 5	5		Drayton Harb., St. Juan de Fuca Strait.	2 0	12	
Denial Bay, Australia, S. Coast.	12 15	6		Drogheda (Bar), Ireland	11 0	11½	9
Denison Port, Australia, E. Coast.	9 30	6		Duart, Isle of Mull -	5 0	12	10
Depuch Isle, Australia, W. Coast.	10 40	14		Dublin (Bar), Ireland -	11 12	12-14	9-11
Desire Port, Patagonia, E. Coast.	12 10	18½		Dumbarton, Scotland -	0 20	9	
Devonport Dockyard, England,	5 43	15½	11½	Dunbar, Scotland -	2 8	14½	11
Dewghur Harbour, Hindoostan, W. Coast.	11 25	9		—— Hindoostan, W. Coast.	10 10	8	
Diamond Island, Bay of Bengal.	10 30	8		Dunbeacon, Ireland -	3 51	10½	7½
—— Point, Malacca Strait.	12 0	9½		Duncan Bay, N.W. Coast of America.	12 0	21	
Diego, San, Bay, California.	9 38	5	3½	Duncansby Ness, Scotland.	10 14	10	7
Diego, San, Cape, Tierra del Fuego.	4 30	10		Dundalk, Ireland -	10 56	13½	11½
—— Garcia Island, Indian Ocean.	1 30	6		Dundee, Scotland -	2 32	14½	11½
—— Ramirez Ids., Tierra del Fuego.	4 0	6		Dungeness, England -	10 45	21½	19
Dielette, France - -	6 40	27	20½	Dunk Island, Australia, E. Coast.	9 28	6-10	
Dieppe, France - -	11 6	27	20½	Dunkerque, France -	12 8	16½	13½
Digby Gut, B. of Fundy	11 0	27½	28	Dunkerron, Kenmare R., Ireland.	3 45	10½	8
Dillon Bay, Erromango Id., Banks Ids.	5 30	4		Dunmanus Harb., Ireland	3 57	9½	7½
Dingle, Ireland -	3 51	10½	7½	Dunmore, Ireland -	5 27	12½	9½
Discovery Port, America, N.W. Coast.	2 30	7		Durnford Port, Africa, E. Coast.	4 45	12	
Dislocation Harb., Tierra del Fuego.	1 40	4		Dusky Bay, New Zealand	11 15	10	8
Diu Island, Hindoostan, W. Coast.	2 0	6		Dvina (Bar), White Sea		3½	
Dives, France - -	9 39	21	16	Dyer Id., Africa, S. Cst.	2 50	5	
Divy Pt., Bay of Bengal		5		Easdale Sound, Scotland	5 10	10-12	
Doboy Lighthouse, U. S.	7 33	7½	7	Easter Id., South Pacific	2 0		
Dodandowe Bay, Ceylon	1 50	1½		East Cape, New Zealand	8 55	7	
Dodo River, Bight of Benin.	4 17	5		—— Point, Prince Edward Island.	8 30	3½	2
Domingo, San, Port, Patagonia, W. Coast.	12 0	7		—— Alligator River, Australia, N. Coast.	8 15	15	
Donaghadee, Ireland -	11 13	11½	9	Eclipse Harbour, Labrador.		5	
Donegal Harb., Ireland -	5 18	11½	8½	Ecrehous, France -	6 32	31	22½
Doris Cove, Tierra del Fuego.	3 0	4		Eddystone Pt., Australia, E. Coast.	9 39	7	
Dornock Road, Scotland	11 47	11		Eden Harbour, Patagonia, W. Coast.	12 30	5	
Douany, Comoro Ids.	4 0	11-12		Edgar Port Falkland Is.	7 15	6	
Douglas, Isle of Man -	11 12	20½	16	Edgartown, United States	12 16	2½	2
—— Road, Bahamas -	8 30	4	2½	Edina, Africa, W. Coast	5 50	4	
Dover, England -	11 12	18½	15	Edmonstone, Id., Sherbro River, Africa.			8
Downham Reach, Orwell, England.	12 27	12		Egg Id. Lt., United States	9 4	7	5½
Dragons Mouth, Caribbean Sea.	3 0	4		—— G. St. Lawrence	2 0	11	6
Drakes Bay, California -	11 41	4½	3½	Egmont Bay, Prince Edward Island.	3 0	4	2
				—— Port, Falkland Islands.	7 30	11	
				Eides Fiord, Færoe Ids.	11 0	9½	7½
				Eigg Id., Scotland -	6 15	14	10
				Elbe, Entrance, Germany	12 0	11	
				Elena Sta., Port, Patagonia, E. Coast.	4 0	17	
				—— Bay, Ecuador -	1 18	8	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Elizabeth Bay, Africa, S. W. Coast.		5-6		Famine Port, Magellan Strait.	12 0	6	
Ellen Port, Islay -	5 0	5	4	Fane Id., Plumper Sound, Oregon.	irr.	12	
Ellenwoods Anchorage, Bay of Fundy.	9 54	13	10½	Fannings Id., S. Pacific -		4	
Elliot Port, Australia, S.C.		5-6		Fanny Hole, Mulroy Bay, Ireland.	6 17	9½	8
Emden, Germany -	12 0			Fansiak Channel, Canton R., China, E. Coast	1 0	7½	5
Ems River, (outer buoy), Germany.	10 0	8-10		Farallon, South, California	10 37	4½	3½
Encounter Rock, Yellow Sea.	10 44	11	8	Fareham (close to the Upper Quay), England.	11 48	11½	8½
Endeavour R., Australia, N. Coast.	8 0	5-10		——— Bridge, Eng- land.	11 51	7½	4½
——— Strait, Aus- tralia N. Coast.	1 0	9½		Farewell, Cape, New Zealand.	9 20	14	10
Endermo Harbour, Japan	5 30	6		Fatsizio, Japan Sea -	6 0	5	
English Bank, San Carlos, Patagonia, W. Coast.	0 4			Fayal, Azores, Atlantic Ocean.	11 45	4	
English Harbour, Antigua		2		Fear, Cape, River, United States.	7 19	5½	4½
English R., Delagoa Bay, Africa, S. Coast.	7 30	5		Fécamp, France -	10 44	23½	18
Enora Bay, Japan Sea -		4		Fenit, Tralee Bay, Ireland	4 3	12½	9½
Eran Bay, (Palawan)	10 10	6½		Feolin Ferry, Jura -	4 41	6½	4½
China Sea, E. Coast.				Fernandina, Clinch Fort, United States.	7 53	6½	6½
Erebus Bay, Barrow Strt.	12 6	8		Fernando Noronha Island, S. Atlantic.	4 0	6	
Erme River, Bigbury Bay, England.	5 40	16½	11½	Fernando Po, Bight of Biafra.	4 0	7	
Erqui, France -	5 59	33½	24½	Ferribly Sluice, River Humber.	6 41	20½	
Errouau or Futuna, S. Pacific.	7 24	4		Ferro, Canary Ids. -	12 30?	9?	
Escumenac, Pt., Gulf St. Lawrence.	4 10	4	2½	Ferrol, Spain -	3 0	15	
Esperanza Inlet, Van- couver Id.	12 0	12		Ferry Side, South Wales	5 49	23	16½
Espirito Bay, Brazil -	3 0	4		Filey Bay, England -	4 20	16	12½
Espirita Santo, C., Ma- gellan Strait.	8 30	36-42		Finisterre, Cape, Spain -	3 0		
Esquimalt, St. Juan de Fuca Strait.*	irr.	7-10	5-8	Fish Hd., G. Manan, Bay of Fundy.	11 16	22½	18½
Essington Port, Australia, N. Coast.	3 24	13		Fishguard, Wales -	6 56	11½	8½
Estevan, San, Port, Pata- gonia, W. Coast.	0 15	5		Fitz-Roy Id., Australia, E. Coast.	9 15	7-12	
Etches Port, America, N.W. Coast.	1 15	9½		Fitzroy Port, Falkland I.	4 45	6	
Evangelists, Patagonia, W. Coast.	1 0	5		Flamand Bay, St. Domingo	irr.	2-3?	
Exmouth, England -	6 21	12½	8½	Flamborough Hd., England	4 30	16	12
Exuma, Bahamas -	7 20	2½		Flamenco Port, Chile -	9 10	5	
Eyemouth, Scotland -	2 15	15?	11?	Flatholm Ids., Bristol Channel.	6 54	37?	28?
Eyre Port, Australia S. C.	10 30	6		Fleetwood Port, England	11 12	26½	19½
Fair Isle, Sbetlands -	11 0	5	3½	——— Wyre Light -	11 11	27	20½
Fairy Port, Australia, S.C.		4		Flesh Bay, or Bay St. Bras, Africa, S. Coast.	3 30?	6?	
Falkland Sound (N. en- trance), Falkland Ids.	6 45			Fleur-de lis Harb., New- foundland.	7 15	2-4	
——— (S. entrance)	7 0			Flinders Group, Australia, E. Coast.	9 15	8-12	
Fall Harbour, Labrador -	6 40	3½		Florida Cape, United States.	8 34	1½	1½
Falmouth, England -	4 57	16	12	Flushing, Belgium -	1 20	15	
False Point, Bay of Bengal, W. Coast.	8 0	8		Fog Ids., Hang-chu B., China, E. Coast.	11 45	17	

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Fogo Id., Newfoundland	7 20	4		Galle, Pointe de, Ceylon, S. Coast.	2 0	2	
Folkstone, England -	11 7	20	16½	Gallegos Port, Patagonia, E. Coast.	8 50	46	
Folly Point, Petitcoudiac River, B. of Fundy.	11 49	45	38	Gallinas R., Africa, W. C.	6 45	4	
Fongwhang Group (Bullock Harb.) China W.C.	8 30	17		Galloway (Mull of) -	11 15	15?	12?
Forçados River, Bight of Benin.	4 22	5		Galway, Ireland -	4 35	14½	11
Forecarreah R., Africa, W.C.	7 40	11		Galveston, G. of Mexico		1½	¾
Formby Point, England -	10 35	28		Gambia R., Africa, W.C.	8 10	6-9	
Formosa Mt., Malacca Str.	8 0	11	8½	Gambier Ids., Australia, S. Coast.	1 50	3	
Fort Dauphin, St. Domingo	7 0	5½	3½	Garliestown, Scotland, W. Coast.		17	12
Fortune Bay, Patagonia, W. Coast.	0 50	7		Garroch Head - -	11 49	10	
Forward Harb., British Columbia.	3 0	16	11½	Gaspé Basin, Gulf St. Lawrence.	2 40	5	3
Foulness, Crouch River, England.	12 5	14½	10½	Gay Head, United States	7 37	7	
Fowey, England - -	5 14	15	11½	Geby, Fohou Id., Gilolo Passage, Moluccas.		5	
Fowlers B., Australia, S.C.	10 30	6		Geelong Harbour, Australia, S. Coast.	2 30	3½	2½
Fox Bay, Falkland Ids. -	7 0	6		George Cape, Nova Scotia	9 15	4	2
Foyle Lough (Warrenpoint), Ireland.	6 20	6½	5	George d'Elmina, St. Africa, W. Coast.	4 30	6	
Foynes Island, Ireland -	5 35	15½	12	—— Port, B. of Fundy	11 17	32	28
France, Port de, New Caledonia.	8 25	4		—— St., Basin, Australia, N. W. Coast.	12 20	24-37	
Francis, St., Bay, Tierra del Fuego.	4 0			—— Shoals, United States.	10 30	7	
Francisco, San (North Beach), California.	12 6	4½	3½	Georges Bay, Tasmania	9 42	3	2
Fraser River (entrance), British Columbia.	6 30	7-10		Georges, St., Sound, G. of Mexico, Mid entrance.	1 31	1½	1½
Fraserburgh, Scotland -	0 40	11	8½	—— West entrance	irr.	2½-4	
Frechette Id., River St. Lawrence.	8 0	14	9	Georgetown, United States	8 40	4½	3½
Frederick Reef, Australia, E. Coast.	8 0	6		—— South Island, United States.	7 56	4½	3½
Frederickshaab, Greenland.	6 3	12½	9½	Geriah Harbour, Hindoostan, W. Coast.	2 40	9	
Freycinet Estuary -	4 15	3½		Germain St., France -	6 20	34	25
—— Reach, Sharks Bay, Australia N.W. Coast.	3 0	5		Ghubbet Ne, Socotra, Indian Ocean.	7 0	7	
Friederichstadt, Denmark	2 37	9		—— Hashish, Arabia, S.E. Coast.	10 0	10	
Frio Porto, Brazil -	2 40	4½		Gibraltar (old Mole) Spain.	2 20	3½	
Froward Cape, Magellan Strait.	1 0			Gigha Sound, Scotland -	2 22	4	2½
Fugloe Fiord, Faroe Ids.	11 15	6½	4½	Gijon Bay, Spain, N. Cst.	3 0	14	11
Funchal Bay, Madeira -	12 48	7		Gilmorris Id., Africa, W. Coast.	6 0	11	
Funk Id., Newfoundland	7 0?	2-3?		Gizree Bunder, Indus, Hindoostan, W. Coast.	9 50	7	
Fury Cove, Patagonia, W.C.	1 15			Glasgow, Scotland - -	1 25	9	7½
—— Harbour, Tierra del Fuego.	2 30	4		—— Port, Scotland -	0 18	9	
Fury Id., Tierra del Fuego	2 30	4		Glenan Iles, France -	3 12	13	10
Fury and Hecla Strait, Arctic Regions.	7 0	8		Glennie Ids., Bass Strait	12 20		
Gaboon R., Africa, W.C.	5 30	3		Gloucester Cape, Tierra del Fuego.	1 30	5	
Galang Bay, Hainan Id., China Sea.		4-5		—— Harbour, United States.	11 4	10½	8½
Gallant Port, Magellan Str.	9 0	5½					

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		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Gluckstadt, Germany -	3 9	10		Granville, France -	6 13	37	27½
Goa, Hindoostan, W.C. -	11 30	6		Gravelines, France -	12 0	19	15
Godbout River, Gulf St. Lawrence.	1 52	11	6	Graves Port, Howe Sound, Gulf of Georgia,* British Columbia.	noon	12	
Goeree (West Gat) -	1 45	7		Gravesend, England -	1 10	17½	14
Gollonsir Socotra, Ind. Ocean.	7 20	8		Great Barrier, Id. (Nagle Cove), New Zealand.	6 25	10	7
Golovnin Bay, America, N. W. Coast.	6 23	3½		Great Barrier Reef, Australia, E. Coast.	8 48	7	
Gomera, Canary Ids. -	12 45?	9?		Great Fish Bay, Africa, W. Coast.	2 30	5-6?	
Gometra, Loch Tuadh, I. of Mull.	5 29	11½	8	Great St. Lawrence Harb., Newfoundland.	8 30	7	4
Gonaives Bay, St. Domingo	8 0	1		Greatman Bay, Ireland	4 39	15½	11½
Good Bay, Newfoundland.	10 40	7½	5½	Green Island, River, St. Lawrence.	2 45	16	9½
Goods Bay, Patagonia, W. Coast.	0 30	7		Greencastle Point, Ireland.	11 2	14	11½
Good Hope, Cape of, China, E. Coast.	9 0			Greenock, Scotland -	12 8	9½	8½
Good News, B. America, N. W. Coast.	6 15	13½		Greenwich, England -	1 43	19	15
Good Success Bay, Tierra del Fuego.	4 3	6-8		Gregory Bay, Magellan Strait.	9 45	23	
Goold Island, Australia, E. Coast.	6 45	6		— Port, Australia, W. Coast.	11 30	3	
Goole, River Humber, England.	7 26	13		Grenada (St. George Harb.), Caribbee Ids.	2 40	1½	¾
Gooriya Creek (entrance), Hindoostan, W. Coast.	11 0	9		Grenadines, Caribbee Ids.	3 0	1½	1
Goose Cove, Newfoundland.	7 0?	2-3?		Grey Port, Swan River, Australia, W. Coast.	9 0	1-1½	
Gorda Sound, Virgin Islands.	8 30	1½		Greytown, Mosquito Cst.	9 0	1½	
Gore Port, New Zealand	9 0	8	6	Gribanika Pt. White Sea	4 50	3	
Gorée, Africa, W. Coast	7 45	2½		Griffin Bay, Haro Archipelago.	irr.	12	
Goree Road, Tierra del Fuego.	4 0	8		Griffith I., Barrow Strait	12 15	3½	2½
Goulburn Ids., Australia, N. Coast.	6 0			Grignet Bays, Newfoundland.	7 0?	2-3?	
Goury, France -	7 6	22	17½	Grimsby, England -	5 36	19½	15
Gowlland Harbour, Discovery Passage, Vancouver Id.	5 30	11		Grindstone Island, Bay of Fundy.	11 47	41	34½
Gracias, Cape, Harbour, Bay of Honduras.	10 30	2		Grisnez Cape, France -	11 27	21½	16½
Grand Cestos, Africa, W. Coast.	5 20	4		Grondine, R. St. Lawrence	9 0	9	6
— Harb., Gd. Manan, Bay of Fundy.	11 7	21	17½	Guambacho Bay, Peru -	6 30	2	
Grand Lahou, Africa, W. Coast.	4 20	4		Guardafui Cape, Africa, E. Coast.	6 15	6	
Grand Passage, B. of Fundy.	10 43	20½	17	Guarmey Bay, Peru -	6 10	2	
Grand Port, Mauritius -	1 0	1½		Guatulco, Mexico, W. C.	1 30	5	
— Rustico, Prince Edward Island.	6 40	4	2	Guayaquil, Ecuador -	7 0	11	
Grande-digue, Madame I., Cape Breton Id.	7 55	6½	4½	Guaymas, Mexico, W. C.	8 0	4	
Grande Point, Chile -	9 45	5		Guernsey, (St. Peter Port,) English Channel.	6 37	26	18½
Granton Pier, Scotland -	2 20	16	12½	Guia Narrows, Patagonia, W. Coast.	2 10		
				Guinchos Kay, Bahamas	7 40	3	
				Gun Cay, Bahamas -	8 30	3	
				Gundavee R. (entrance), Hindoostan, W. Coast.	2 0	19	
				Gunfleet Sand, England -	11 40	12	8
				Gutzlaff Id., China, E. C.	11 30	15	
				Guysborough, Nova Scotia.	8 20	6½	4½

* From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Gweedore (Bunbeg), Ireland.	5 32	11	8	Hearts Content, Newfoundland.	7 30	4	2½
Haarlem, Netherlands -	9 0			Héaux Lights, France -	5 45	31	23½
Habitable Id., Lapland -	7 9	9		Heawandou Pholo Atoll, Maldives.	9 30	5	
Habitants Harb., C. Breton, Id.	8 20	6½	4½	Heda Bay, Japan Sea -		5½	
Haimun Bay, China, E. Coast.	9 0			Helena St., Bay, Africa, W. Coast.	2 30		
Haiti Cape, St. Domingo	6 0	3		—— Id., S. Atlantic	3 11	3	
Haiyun-tau, (Thornton Haven), Yellow Sea.	9 30	12	8	—— St. Sound, U.S.	7 8	7½	6
Hakluyt Head, Nova Zembla.	1 30	4		Helford, England -	4 43	15½	11½
Hakodadi Harb., Yezo Island, Japan.	5 0	3		Helgoland, German Ocean	11 33	9½	7
Halifax, Nova Scotia -	7 49	6	5	Helier, St., Jersey, English Channel.	6 36	31½	23
Halt Bay, Patagonia, W. Coast.	0 30	8		Hell Gate Approaches, United States.			
Hamburg, Germany -	5 29	6½		—— Long Id., (Blackwells Dock).	9 59	6	5½
Hamilton Port (Korea), Yellow Sea.	8 30	11		—— N. of Astoria Ferry.	9 48	6½	5½
Hammelin Pool, Sharks Bay, Australia, N.W. Coast.	5 0	3½		—— Pot Cove, (S.E. part).	10 48	8½	6½
Hammerfest, Norway -	1 10	9		—— Wards Id., (Paupers Dock).	10 9	6½	5
Hammond Knoll, England, E. Coast.	7 40			Hellevoetsluis, Netherlands.	2 30	8	6
Hang-chu Bay (Seshan Ids.), China, E. Coast.	11 45	14		Henlopen Cape, United States.	8 0	4½	
—— (Fog Ids.) -	11 45	17		Henry Cape, United States	7 40	4	
—— (Chapoo Rd.)	12 0	25		Henry Port, Patagonia, W. Coast.	12 0	5	
—— off Can-pu -		32		Hernando Id., Strait of Georgia, B. Columbia.	6 0	12-14	
Hanover Bay, Australia, N.W. Coast.	11 30	24-38		Hermite Isle, Australia, W. Coast.	10 0	14	
—— Sound, Bahamas	8 15	4	3	Heron Islet, Capricorn Group, Australia, E. C.	9 0	10	
Harbour of Mercy, Magellan Strait.	1 22	4		Herradura Port, Chile -	9 8	5	
Harbour Grace, Newfoundland.	7 30?	7?		—— Nicoya Gulf -	3 9	10	
Harbour Id., Nova Scotia	7 40	6½	4½	Hesquiat Harbour, Vancouver Id.	12 0	12	
Hardy Port, New Zealand	9 55	8	6	Hewett Bay, Tierra del Fuego.	0 30	6½	
Haro Strait (Channels leading to, from St. Juan de Fuca Strait).	irr.	10-12		Heybridge, Blackwater, River, England.	12 20	12	8
Harrington Port, England	11 5	26	19	Hie-chechin Bay, China, E. Coast.	7 0		
Hartlepool, England -	3 28	15	11½	Hicks Bay, New Zealand	9 0	7	
Harvey Prt. (Call Creek), Vancouver Id.	0 30	10		Hierting, Jutland -	2 45	5	
Harwich, England -	12 6	11½	9½	Higbees, Cape May, United States.	8 33	6½	5½
Hastings, England -	10 53	24	17½	Hillsborough Bay, Prince Edward Id.	10 45	9½	7
—— Harbour, Bay of Bengal, E. Coast.	10 40	13½		—— Island (New Port), Bonin Islands.	11 32	3½	
Hatteras Inlet, United S.	7 4	2½	2	Hillswick Firth, Shetland	9 45	6½	5
Haute Isle, Bay of Fundy	11 21	33	28½	Hilton Head, United States	7 19	7½	6½
Havana, Cuba -	8 14	3		Hiogo Bay, Japan Sea -	irr.	5	
Havannah Harb., Sandwich Id., Banks Ids.	7 15	4		Hirtshala, Jutland -	4 28	1	
Haverfordwest, Wales -	6 42	7½	2½	Hobarton, Tasmania -	8 15	4½	3½
Håvre, France -	9 51	22	18				
Hawke B., New Zealand	7 50	3					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hoe-e-tow Bay, China, E. Coast.	12 15	16		Hunter Port, Australia, E. Coast.	9 45	6-7	
Hokianga R. (entrance), New Zealand.	9 45	10		Hurst (Camber), England	{ 10 0 12 0 }	7½	6
Hokianga R. (Kokohu) New Zealand.	10 15	10	7	Husum, Denmark -	2 36	9	
Hollesley, England -	11 30	8?	6?	Hyannis, United States -	12 22	4	3
Holmes Hole, United States.	11 43	1½	1½	Ichabo Id., Africa, W. C.	1 0	6	4
Holsteinborg, Greenland	6 30	10		Ilfracombe, England -	5 42	27½	21½
Holy Island, England -	2 30	15	11½	Iki, Japan Sea -	-	8	
Holyhead, Wales -	10 11	16	12½	Ilha Grande, Brazil -	12 30	5	4
Hon-cohe Bay, China Sea, W. Coast.	11 30	5		Ilheo, Port d', Africa, W. Coast.	3 0	8-10	
Hondenklip Bay, Africa, S. W. Coast.	2 30	5½		Iliolo Port, Filipinas -	12 0	5½	
Honfleur, France -	9 29	23½	18	Inagua, Bahamas -	8 0	3½	2½
Honghai B., China, E. C.	10 0	6½		Indefatigable Id., Galapagos.	1 56	6	
Honoruru, Sandwich Ids.	4 0	2		Independencia Bay, Peru	4 50	4	
Hongkong, China, E. C.	10 15	4½		Indian Cay, Florida -	8 23	2½	1½
Hoogly R. (W. entrance), Bay of Bengal, W. C.	10 0	10½		Indus (Gizree Bunder), Hindoostan, W. Coast.	9 50	7	
Hooper Island, Korea, S. Coast.	9 10	11½	8½	Inhambane R., Africa, E. C.	4 15	10	
Hope Harb., Falkland Ids.	8 10	7		Inishbofin, Ireland -	4 34	12½	9½
— Sound (Mia-u-tan Group), Yellow Sea.	10 24	6½		Inishkeel, Ireland -	5 10	11	8
Horn Cape, Tierra del Fuego.	4 40	9		Inishturk, Ireland -	4 36	12½	9½
Horn or Blaavand Point, Jutland.	1 44	5		Inkanskie, White Sea -	9 15	14	
Horton Bluff, B. of Fundy	12 30	48	40	Inman Cape, Tierra del Fuego.	2 0	4	
Hougue La, France -	8 42	18½	14½	Intsi Point, White Sea -	11 55	16	
Houardel, France -	11 26	27½	21	Inverary, Scotland -	12 0	10	
Hout B., Africa, W. Cst.	2 20	5		Inverness, Scotland -	12 18	12	9½
Houtman Rocks, Australia, W. Coast.	11 30	2½		Investigator Rd., Australia, N. Coast.	8 0	9	
Howden, R. Tyne, England.		12		Iona Sound, Scotland -	5 11	11½	8½
Howe, West Cape, Australia, S. Coast.	9 0	6		Ipswich, England -	12 35	13½	
Howth Harbour, Ireland	11 9	13	10	— United States -	11 26	10½	8½
Huacho Bay, Peru -	4 45	3		Iquiqui Road, Peru -	8 45	5	
Huafu Islands Patagonia, W. Coast.	12 0	7		Ireland Id., Bermudas -	7 4	4	
Huapilinao Hd., Patagonia, W. Coast.	1 25	15½		Isidro St., Cape, Magellan Strait	1 0	8	
Huasco Port, Chile -	8 30	6	4	Island Harbour, Choiseul Id., Falkland Islands.	5 20	6	
Huuldad Inlet, Patagonia, W. Coast.	0 48	16-20		Islay, Peru -	8 53	7	
Hu-i-tau Bay, China, E. Coast.	12 15	16		Isle-aux-Coudres, R. St. Lawrence.	4 25	17	10
Hukkar R. (entrance), Hindoostan, W. Coast.	10 30	11		Isles de Los, Africa, W. C.	6 35	13	
Hull, England -	6 29	20½	16½	Isolette Cape, Arabia, S. E. Coast.	9 0	10	
— Bridge, Crouch R., England.	12 25	16	11	Ives, St., England -	4 44	21	15
Hulu Shan B., Yellow Sea	2 30	8	6	Jacinto, Port San, Ticao Id. Filipinas.	6 30	6	
Humboldt Bay, California	12 2	5½	4½	Jackson Port (N. Head), Australia.	8 15		
Hunter Id., Bass Strait -	11 30	8		Jacmel, St. Domingo -	irr.	2-3?	
				Jaffrabat, Hindoostan, W. Coast.	11 35	9	7½
				James Id. (Adam Cove), Galapagos.	2 14	5	
				— N. side, Galapagos.	2 34	5	
				James Id., W. end, Galapagos.	3 10	5	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
James R. (City Point) U.S.	2 11	3	2 $\frac{3}{4}$	Junkseylon Id. (E. Side),	10 0	11 $\frac{1}{2}$	
Jashk Shoal, Persian Gulf.	9 30	8		Malacca Strait.			
Jask Cape, Persian Gulf	6 0	6		Jura Island, (Small	5 3	3 $\frac{1}{2}$	2 $\frac{1}{2}$
Jebogue, Bay of Fundy-	10 4	15	11 $\frac{3}{4}$	Isles), Scotland.			
Jedore, Nova Scotia -	7 45	6 $\frac{1}{2}$	4 $\frac{1}{4}$	—Feolin Ferry „	4 41	6 $\frac{1}{2}$	4 $\frac{1}{2}$
Jekatarina Ids., Lapland	6 23	10		Kaikora Penin, New Zea-	5 30	8	6
Jerba, Mediterranean -	3 10	7	5	land.			
Jericoacoara, Brazil -	11 30	12	9	Kaipara Harb. (entrance),	10 55	10	8
Jersey (St. Helier), English	6 36	31 $\frac{1}{2}$	23	New Zealand.			
Channel.				Kalgalakska, White Sea	6 50	7	
— (Rosel) -	6 15	30	21 $\frac{1}{2}$	Kalian Point, Banka Strait	8 17*	12 $\frac{1}{2}$	
Jervis Bay, Australia, E.	6 20	6-9		Kandalaksha, White Sea	3 25	7	
Coast.				Kanushin Cape, White Sea	11 54	15	
Jezirat Arabi, Persian G.	6 30?			Kapiti Island, New Zealand	9 0	6	
— Hamar-al-nafur,	9 30	10		Karachi Harb. (entrance)	10 30	9 $\frac{1}{2}$	6
Arabia, S.E. Coast.				Hindoostan, W. Coast.			
— Jün Persian Gulf	11 30	10		Karakoa Bay, Owyhee -	3 49		
— Kabr „ -		8 $\frac{1}{2}$		Kata, Japan Sea -	6 4	6 $\frac{1}{2}$	
— Kais „ -	0 45	7 $\frac{1}{2}$		Katwyk, Netherlands -	2 30	5	7
— Kharg or Káreg „	8 0	6 $\frac{1}{2}$		Kawau Id., New Zealand	6 30	10	
— Larek „ -	10 15			Kawhia Harb., New Zea-	9 30	12	
— Tumb „ -		8		land.			
Jiddah, Red Sea -		3		Keats Port, Australia,	6 0	22	
Jijginsk Island, White	5 15	4		N. Coast.			
Sea.				Kedewarry, Hindoostan	9 57	9	
Joao San, Brazil -	6 24	14	10 $\frac{1}{2}$	Keelacarry, Ceylon -	11 0		
Johanna Id., (anchorage)	3 40	11		Kedgerree, Bay of Bengal	11 30		
— Pomony Harb.,	4 0	11	9	Keeling Islands (Port	5 30	5	
Comoro Ids.				Refuge), Indian Ocean.			
John St., Bay of Fundy -	11 21	27	23	Kegashka B., G. St. Law-	10 45	5	3
— Newfoundland -	7 30	6	4	rence.			
(East Coast).				Kelung Harb. (Formosa),	10 30	3	
— (North Coast) -	10 40	7 $\frac{1}{2}$	5 $\frac{1}{2}$	China Sea, E. Coast.			
— River, Africa,	4 0	5		Kenmare R. (W. Cove),	3 52	10	7 $\frac{1}{2}$
S. Coast.				Ireland.			
— River, U. S. -	7 28	5 $\frac{1}{2}$	5	Kenn Reef, Australia, E.	8 0	5 $\frac{1}{2}$	
Jonquiere Bay, Gulf of	10 0	6		Coast.			
Tartary.				Kennebec River (Hanni-	11 15	9 $\frac{1}{2}$	6
Joombas R., Africa, W.C.	8 10	6		wells Point), U.S.			
Jooria, Hindoostan, W.C.	2 0	16	12 $\frac{1}{2}$	Kent Island, Bass Strait	11 10		
Josef, San, Port, Patagonia,	10 0	30	25	Kentish Knock, England	11 47		
E. Coast.				Keppel Bay, Australia, E.	9 30	9-14	
Jourimain Island, New	9 30	6	3	Coast.			
Brunswick.				Keret, White Sea -	3 8	6	
Juan de Nova, Madagascar		5		— Point, White Sea	4 30	5 $\frac{1}{2}$	
Juan Fernandez I., Chile	9 30	4		Kerguelen Island, Indian	2 0	2	
Juan San, Porto Rico -	8 2	1 $\frac{1}{2}$		Ocean.			
— San Port, Peru -	5 10	3		Kesm, Persian Gulf -	11 0	12	
Juby Cape, Africa -		8		Kettle Cove, United States	7 48	5	4 $\frac{1}{2}$
Judith Point, United States	7 32	3 $\frac{1}{2}$	3 $\frac{1}{2}$	Khór Jerámeh, Arabia,	9 30	10	
Jukan Ids., Lapland -	9 0	13		S.E. Coast.			
Julian, San, Port, Pata-	10 45	30		Kijouk Phyou Harbour,	10 0	9	6
gonia, E. Coast.				Bay of Bengal.			
Julianshaab, Greenland -	5 6	7	5	Kilbaha, Ireland -	4 16	13	9 $\frac{1}{2}$
Julien, St., Harbour, } 7 21 A.M.				Kilda, St., Hebrides -	5 30		
Newfoundland. } 6 30 P.M.		4 $\frac{1}{2}$	3	Kildin Id., Lapland -	6 45	12	
Junk Fleet entrance, Can-	11 50	6 $\frac{1}{2}$		Kilkieran Cove, Ireland -	4 34	15 $\frac{1}{2}$	11
ton River, China.				Killala Bay, Ireland -	5 22	10 $\frac{1}{2}$	8
Junk River, Africa, W. C.	5 45	5		Killeany Bay, Arran Ids.,	4 28	13 $\frac{1}{2}$	10
				Ireland.			

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Milligholme (Humber R.), England.	6 2	19½	15½	Kyle Rhea, Scotland -	6 0	15	11
Killybegs, Ireland -	5 16	11½	8½	Kyuquot Sound, Vancouver Id.	12 0	12	
Killyleagh, Ireland -	12 40	11	9½	La Poile Bay, Newfoundland.	9 0	6	4
Kilmichael Point, Ireland	8 30	4½	3	Labuan Id., China Sea, E. Coast.	9 45	6	
Killybegs, Ireland -	4 42	14	10½	Labyrinth Ids., Magellan Strait.	0 30	5½	
Kincardine, Firth of Forth, Scotland.	2 53	17½	15	Lacul Harb., St. Domingo	6 0?	3?	
King Id., Bass Strait -	1 0			Lady Bay, Australia, S. C.		4	
King Port, Falkland Ids. — Sound, Australia, W. Coast.	7 30	5		Lady Elliot Islet, Australia, E. Coast.	9 0	7-8	
Kingsbridge, England -	5 46	10		Lagos, Portugal -	2 7	13	
Kingstown, Ireland -	11 10	11	8½	———River (Bar), Bight of Benin.	6 0	3	
Kinsale, Ireland -	4 43	11½	9	Lagos River (Consulate Wharf.)		2	
Kinshang Point, China, E. Coast.	7 0			——— (Palaver Ids.)		1	
Kirrabbin, Ireland -	12 42	11½	9½	Iaguimanoc Port, Luzon	1 30	5½	
Kiriadi, Ceylon -	3 30			Laguna de Terminos, G. of Mexico.	noon.	1½	
Kirkcudbright, Scotland	11 10	23		Lamalin, Newfoundland	9 15	8½	
Kirkwall, Orkneys -	10 9	10	7½	Lambayeque Rd., Peru -	4 0	3	
Kismu, see Kesm.				Lamlash, Scotland -	11 49	10	7
Kiwara Harb., Africa, E. Coast.	4 30	12		Lamo Harb., Africa, E. Coast.	4 6	11	
Kitmapatnam, Bay of Bengal, W. Coast.	11 0	1½		Lancaster, England -	11 16	8½	
Kiskino Inlet -	12 0	12		Landshipping, Cleddau River, Wales.	6 27	20	14½
Kiskish Inlet, Vancouver Id.	12 0	12		Langshan Crossing, Yangtse-Kiang.*	1 40	12	8
Knox Bay, Vancouver Id.	12 0	16		Lankeet Island, Canton River, China.	11 20	6½	
Krepang, Timor -	11 0	9	6½	Lansew Bay, China, E. C.	10 0	13	
Kokohu, New Zealand -	10 15	10	7	Lanzarote, Canary Ids. -	1 0?	9?	
Ko-kun-to Group, Korea, W. C.	2 25	18	10	Laredo B, Magellan Strt.	11 30	9	
Kok-si-kon Prt. (Formosa) China Sea, E. Coast.	11 30	3		Largs, Scotland -	11 50	10	
Koombanah B., Australia, W. Coast	9 0	½-3		Latham Id., Africa, E. Cst.	4 0	10	
Koree R. (Monda Point), Hindoostan, W. Coast.	11 40	11		Latitude Bay, Tierra del Fuego.	2 5	4	
Kouloi River -	1 15	20		Lau-mu ho, Yellow Sea -	1 30	5	
Kou Zomen, White Sea -	3 30	6		Laun, Great and Little, Newfoundland.	8 15	7	4
Kuda Bay, White Sea -	3 25	6		Laura Harb., Tierra del Fuego.	1 0	6	
Koweit, Persian Gulf -	0 15	9		Lavata Bay, Chile -	9 20	5	
Krakatoa, Strait of Sunda	7 0	4		Lawrence, Great St., Harb. Newfoundland.	8 30	7	4
Kaper Harbour, Korea, S. Coast.	9 28	11½	8½	Le Have Cape, Nova Scotia.	7 48	7	5½
——Port, America, N. W. Coast.	1 40	13	10½	——— Nova Scotia, Crooked Channel.	7 51	7½	6
Kanyán Muriyán Bay and Islands, Arabia, S. E. Coast.	8 20	6½		——— Mothers Island	7 51	7	5½
Karrachee, see Karachi.				——— Getsons Cove	7 55	7½	6
Kawshan Ids., China, E. Coast.	9 30	14		——— Bridgewater (McKean's Wharf.)	8 6	8	6½
Kyan-chau Bay, Yellow Sea.	5 0	12	9	——— Lunenburg (Spidlers Cove.)	7 54	7½	6
Kyam River, White Sea	5 23	4		Le Maire Strait, Tierra del Fuego.	4 0	7	
Kykduin, Netherlands -	7 0	12					
Kyle Akin, Loch Alsh, Scotland.	6 16	15½	11				

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Leervig Fiord, Færøe Ids.	0 30	6½	4½	Lizard Point, (Perran Yose Cove), England.	5 0	14½	10½
Leith, Scotland - -	2 17	16½	12½	Llanelly (Bar), Wales -	6 16	28	21
Leman Shoal, England, E. Coast.	6 0			Lloyd Port, Bonin Ids. -	6 8	3	
Lennox Cove, Tierra del Fuega.	4 40	8		Loanda, San Paul de, Africa, W. Coast.	4 30	5	
Leopold Port, Barrow Strt.	12 6	6	4½	Lobah Point, Banka Strt.*	11 0†	10	
Lepreau, Bay of Fundy -	11 18	24½	21	Lobito B., Africa, S.W. Coast.	2 20	5	
Lerwick, Shetland -	10 30	6	4	Lobo Point, Peru -	8 0		
L'Etang Harb., Bay of Fundy.	11 19	23½	20	Lobos Cay, Bahamas -	7 40	3	
Leubu River, Chile -	10 30	5		Lobos Head, Patagonia, W. Coast.	0 29		
Leven Port, Madagascar	3 30	7½		Loch Aline, Scotland -	5 33	13½	10½
Levrier Bay Africa, W. Coast.	12 0	6-7		— Alsh " -	6 16	15½	11
Lewis Cape, St. Labrador	6 30			— Boisdale " -	5 47	12½	9
Liant Cape (G. of Siam), China Sea, W. Coast.	5 7	6½		— Broom " -	6 40	14½	10½
Liau Ho (Bar), Yellow Sea.	4 0	11½	7½	— Carron " -	6 29	16½	11½
— (entrance) -	5 0	12		— Cuan " -	5 36	13	9½
Liau-tung, Chingho, Yellow Sea.	1 20	6½		— Duich " -	6 0	15½	11
— Gulf (Sand Point), Yellow Sea.	4 50	7	5½	— Dunvegan, " -	6 7	15½	11
— N.W. Head of Gulf.	5 30	10	8½	— Eil (Head of Loch)	6 27		
Limerick, Ireland -	6 16	18½	13½	— Eport " -	6 6	12½	9½
Lindy River (entrance), Africa, E. Coast.	4 15	12		— Eriboll " -	7 43	14½	11
Lingeh, Persian Gulf -	12 0?			— Erisort " -	6 43	15½	11½
Lintin Island, Canton R. China, E. Coast.	12 0	7½		— Etive, Stonefield " -	7 3		
Lisbon (Belem), Portugal	2 30	12	9	— Bunawe " -	7 54	5½	
Liscanor Bay, Ireland -	4 23	13½	10	— Ewe " -	6 39	14½	10½
Liscomb Harb., Nova Scotia.	8 0	6½	4½	— Goil " -	12 6	10	6
Lishan Bay, China, E. C.	10 15	16		— Hourn " -	5 45	13½	10½
List, Denmark -	2 21	6		— Inver " -	6 40	14	11
Litau Bay, Yellow Sea -	3 0	6	4	— Laxford " -	6 44	15	11½
Litke Ridge, White Sea -	11 45	15		— Leven (Head of Loch)	6 28		
Little Egg Harbour, } United States - }	7 10	4½	3½	— Linnhe " -	5 26	12½	8½
Little Fish Bay, Africa, W. Coast.	2 30	5-6?		— Long " -	12 6	12	
Little Gull Island, U. S. -	9 38	3	2½	— Maddy " -	6 6	12½	9½
Littlehampton, England	11 36	16	11½	— Moidart " -	5 44	13½	9½
Little Metis, G. St. Law- rence.	2 10	13	8	— Nevis " -	5 47	14½	10
Little Milford Quay, River Cleddau, Wales.	6 31	19	13½	— Roag " -	6 11	11	8
Little Natashquan, G. St. Lawrence.	11 0	5	3	— Ryan " -	11 12	11	
Little Tancock Island, Nova Scotia.	7 43	7½	6	— Skipport " -	5 52	12½	9
Liverpool, England -	11 23	26	20½	— Strivan " -	11 55	6	
— Bay, Nova Scotia.	7 50	8	5	— Sunart " -	5 40	13½	
Liza Bay, Lapland. -	5 58	9		— Tarbert, West, Har- ris Island, Scotland.	6 4	11½	8½
Lizard Id., Australia, E. Coast.	9 15	7-10		— Tarbert, East, Scot- land.	6 10	13½	10
				— Tongue " -	7 53	15	12
				— Torridon " -	6 20	15	11
				— Tuadh " -	5 29	11½	8
				Lofoten Ids., Norway -	12 0	9	7½
				Loheia, Red Sea -	1 30	3	
				Loire R. (St. Nazaire), France.	3 40	15½	11
				Lomas Point, Peru -	8 19	5	
				Lombock, (Ampanam B.), Java Sea.	8 0	6	
				London Bridge, England	2 7	19½	16½
				— Docks, England	1 57	19½	17
				Londonderry, Ireland -	8 1	7½	5½

* In S.E. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Loe (East), England -	5 26	16	13	Madras Road, Coroman- del Coast.	7 34	3½	
Lookout Point, United S.	0 58	2	1½	Magadoxa, Africa, E. Cst.	4 30	8	
Lopez Cape, Africa -	4 30	4-6?		Magdalen Ids., G. St.	8 20	3	2
L'Orient (Port Louis), France.	3 11	13	9½	Lawrence.			
Lord Howe Island, S. Pacific.	8 30	6		—— River, R. St.	11 0		
Lo-shan-kan, Yellow Sea	4 30	11	9	Lawrence.			
Lough Larne, Ireland -	10 48	6½	6½	Magdalena Sta., Island, Magellan Strait.	12 0	10	
—— Rossmore, Ireland	5 20	11	8	Magdalene B., California	7 35	6½	
Lois Port, France -	3 11	13	9½	Mahato Id., Africa, E. C.	4 30	7	
—— Mauritius -	12 30	3	2½	Mahneah R., Africa, W. C.	7 40	11	
Louis, St., Bay, St. Do- mingo.	irr.	2-3?		Mahone Bay, Nova Scotia	8 0	7	
Louisburg Harb., Cape Breton Id.	8 0	5	4	—— Heckmans	7 45	7½	6
Low Bay, Falkland Ids.	5 0	5½		Anchorage.			
—— Port, Patagonia, W. Coast.	0 40	7		—— Princes Inlet	7 42	7½	6
Lowestoft, England -	9 57	6½	5½	—— Ham Island	7 47	7½	6
Lubo River (entrance), Africa, E. Coast.		22		—— Martins R.	7 43	7½	6½
Lucas San, Bay, California	9 20	9½		—— Chester -	7 44	7	5½
Lucipara Pass, Banka Strait.	irr.	10	7½	Mahons R., United States	9 52	7	5½
Luis St., Texas, G. of Mexico.		1½	½	Maiden Rocks, Ireland, N. E. Coast.	10 43	6½	6½
Luis Obispo, San, California	10 8	4½	3½	Majambo B., Madagascar	4 30	16	
Lumaire Bay, Newfound- land.	7 0?	2-3?		Makátein, Arabia, S. E.	9 0	6	
Lundy Island, England -	5 15	27	20	Coast.			
Lung-mun Harbour, Yellow Sea.	10 0	7		Makalleh, Arabia, S. E.	8 30	7	
Lyme Regis, England -	6 21	11½	8½	Coast.			
Lymington England -	{ 10 25 } 12 15	{ 8 } 23	{ 6 } 18	Makumba R., Madagascar	4 45	17	
Lynn Deep, England -	6 0	23		Makung Harb., Pescadres, China Sea.	10 30	9½	7
—— Harbour „ -		18		Malabrigo Port, Peru -	5 0	2	
—— Road „ -		20		Malacca Strait (light ves- sel, one fathom bank).	6 0	15	12
Lytelton Port, New Zea- land.	3 50	7½	5½	Malacca Strait (off Mount Formosa).	8 0	11	8½
Mahou River, C. Breton Id.	9 0	4		—— Road, Malacca St.	7 30	11	8½
Macabé, Brazil -	2 30	9½		Malaga, Spain -	12 0	3	
Macao, China, E. Coast -	10 0	6½		Malahide Inlet, Ireland	11 15	10	8
Macassar, Celebes -	4 40	5½		Malcolm Atoll, Maldives	10 30	3	
McDougall Harb., Africa, S. W. Coast.	2 30	5½		Maldon, Chelmer River, England.	12 32	10	6
Maceio, Brazil -	4 30	8½		Malé, Maldives -	12 30	3	
Machias, Seal Id., Bay of Fundy.	11 5	18	14½	Malludu Bay, Borneo -	10 30	6-8	
Macowa, Red Sea -	0 30	2		Malo, St., France -	6 5	35	26
Macquarie Harbour, Tasmania.	7 30	3		Malpelo Point, Peru -	4 0	10	
—— Port, Aus- tralia, E. Coast.	8 56	4-5		Man-of-War Cay, Baha- mas.	8 10	4	
Macquereau P., G. St. Lawrence.	2 0	5	3	Mana Island, New Zealand	7 0	8	6
Madame Id., Madagascar	4 0	5		Manama, Persian Gulf -	5 20	7	
Madoc Port, Wales -	7 30	17		Manawatu River, New Zealand.	10 0	8	6
				Mancenilla Bay, St. Do- mingo.	7 0	4-5	
				Mandavee Roads, Hin- doostan, W. Coast.	11 50	15	11
				Manicouagon River, R. St. Lawrence.	2 15	12	7
				Manila (Luzon Island), China Sea, E. Coast.	10 40	2½	
				Manning River, Aus- tralia E. Coast.	9 15	4	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Neaps.			Springs	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Manora P., Karachi, Hindoostan, W. Coast.	10 30	9½	6	Massacre Bay (Tasman corner), New Zealand.	8 45	13	9
Manorah R., Hindoostan, W. Coast.	1 30	16		Massacre Bay, Motu Pipi River, New Zealand.	9 50	14	10
Manta Port, Ecuador -	3 4	6		Massowah, Red Sea -	1 0	3	
Manukau Har. (entrance). New Zealand.	9 30	13	10	Matan River, G. St. Lawrence.	2 15	11	7
Manybranch Harb., Falkland Ids.	7 40	7½		Maule River, Chile -	10 0	5?	
Maplin Light (Thames), England.	12 5	14½	10½	Maulmain, Bay of Bengal,	2 0	22	17
Maquereau Point, G. of St. Lawrence.	2 0	5	3	Mauritius (Port Louis) -	12 30	3	
Maranham, Brazil -	7 0	16½	10¾	—— (Grand Port) -	1 0	1½	
Marblehead, United States	11 30	12		May Cape, United States	8 19	6	5
March Harb., Tierra del Fuego.	3 10	6		Mayday Bay, Palawan -	9 55	3½	
Marcouf, St., France -	9 55	20		Mayhé Id., Indian Ocean	4 0	6½	
Mare Harb., Falkland Ids.	6 0	6		Mayotta Id., Mozambique	4 10	11½	
Margarets, St., Bay (Shut-in Island) Nova Scotia.	7 47	7½	6	Mayumba, Africa, S.W.C.		7	
Margate, England -	11 40	15½	13	Mazambo Port, Madagascar.	4 30	15	
Maria Cape, Saghalin Id., Sea of Okhotsk.	2 0	5		Mazatlan, Mexico, W. Cst.	9 40	7	
Maria Sta., Id., Chile -	10 20	6		Meichen Sound, China, E.C	12 30	17	
Maria Van Diemen Cape, New Zealand.	8 0	7		Melbourne, Australia, S.C.	2 43		
Maristow, River Tavy, England.	5 47	8½	4½	Melinda P., Africa, E. C.	4 15	11	
Marjoribanks Harbour, Korea, W. C.	3 30	29		Mellacoree R., Africa, W. Coast.	7 40	11	
Mark, St., Bay of, St. Domingo.	3 0?	1?		Mellish Reef (Sand Cay), Australia, E. Coast.	7 55	5-6	
Marka or Muerka, Africa, E. Coast.	4 30	8		Mellon, Ireland -	6 1	18½	15
Marks, St., United States	1 14	3	2½	Melo Port, Patagonia, E.C	3 40	15	
Maroni Bay, Comoro Ids.	4 53	10	6	Memory Rock, Bahamas.	7 50	3	
—— River, Guayana	5 30	8		Menadou Bay, C. Breton Island.	8 15	5½	
Martaban, Bay of Bengal	2 20	21		Menam River, (Paknam), China Sea, W. Coast.	5 7	9½	
Martin, St., Cove, Tierra del Fuego.	3 30			Menemsha Bight, U.S. -	7 45	4	
—— C. Horn	3 50	8		Mensular Id., S.E. end, Sumatra.	6 0	4	
Ids., Tierra del Fuego.				Merbát, Arabia, S.E. Cst.	9 0	6¾	
Martin, St., de la Arena, Spain, N. Coast.	3 30	15		Mercy Bay, Banks Land		2	
Martin Vas Rocks, South Atlantic.	3 45			Mercury Bay, New Zealand.	7 21	7	5
Martinique, Robert Harb. Carribean Sea.		4-5		Mergui, Bay of Bengal, E. Coast.	10 30	18	
Mary, Cape St., Newfoundland.	8 30	7	5	Merigemish, Nova Scotia	10 6	5½	
Mary St. Harb., Madagascar, E. Coast.	4 0	5		Merjee R., Hindoostan, W. Coast.	11 0	7	
—— Newfoundland -	7 40	7½	5	Merville, France -	9 36	21	17½
Mary, Port St., I. of Man	11 10	20	16	Metway Port, Nova Scotia	7 50	8	5
—— St., Scilly Is. -	4 18	15¾	11¾	Mevagizey, England -	5 4	15½	12
Maryport, England -	11 3	18	13	Mexillones Port, Bolivia	10 32	3	
Mascat, Persian Gulf -	11 15	6		Mezen, White Sea -	1 48	15-22	
Mason B., New Zealand	11 10	8	6	Miau-tau, (Depôt Bay), Yellow Sea.	10 35	6	
				Miaveness, Færoe Islands.	3 12	6½	4½
				Michael, St., Azores -	12 30	6	
				Michael Seymour Port, Gulf of Tartary.	5 30	3	
				Middle Cove, Tierra del Fuego.	3 30		
				Middle Island, Patagonia, W. Coast.	12 0		

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Middlesbrough, R. Tees, England.	3 55	13		Montrose, Scotland -	1 25	13	10
Middleton R., Bight of Benin.	4 15	5		Monts, Point de, Gulf St. Lawrence.	12 0	12	6
Milford Haven (St. Ann Lighthouse), Wales.	5 56	24	18	Moreno (Constitucion Road), Peru.	10 0	4	
Milford Sound, New Zealand, Mid. Island.	9 15	8	6	Moreton Bay, Australia, E. Coast.	9 30	3-7	
Millman Island, Palawan, W. Coast.	10 27	2 $\frac{3}{4}$		Morewellham, R. Tamar, England.	6 12	10 $\frac{1}{2}$	6 $\frac{1}{2}$
Millport, Cumbrae Island, Scotland.	11 50	10	6	Morjovets Id., White Sea	11 20	17	
Min R. (Temple Point), China, E. Coast.	10 45	19	14 $\frac{1}{2}$	Morlaix Road, France -	4 53	24	18
Min R. (Losing Island), China, E. Coast.	12 0			Morro (Sandy Pt.), Ecuador.	5 0	11	
Mindanao, Filipinas -	7 0	6		Mossel B., Africa, S. Coast.	3 30	6	
Minehead, England -	6 30	35	26 $\frac{1}{2}$	Moudinga Id., White Sea	5 50	3 $\frac{1}{2}$	
Mingan Harbour, Gulf St. Lawrence.	1 16	6	4	Mount Desert Island, United States.	11 10	13	
Mingan Id., G. St. Lawrence	1 30	6	4	— Louis Bay, R. St. Lawrence.	11 0	6-8	4
Minimegash, Prince Edward Island.	3 30	5	3	Mourondava, Madagascar, W. Coast.	4 45	12	
Minow Islands, Madagascar, W. Coast.	5 0	15		Mouton Port, Nova Scotia	7 54	7 $\frac{1}{2}$	5 $\frac{3}{4}$
Minquiers Rocks, France	6 6	35	26	Moville, Ireland -	7 6	7 $\frac{1}{2}$	5 $\frac{1}{2}$
Miramichi (Bar), Gulf St. Lawrence.	5 30	5	3	Mozambique Har., Africa, E. Coast.	4 15	12	
Mira-por-voe, Bahamas -	9 30	3	2 $\frac{1}{4}$	Mucaras Reef, Bahamas	7 40	3	
Mirs Bay (Tide Cove), China, E. Coast.	10 0	6 $\frac{1}{2}$		Muerka, <i>see</i> Marka.			
Miscou, G. of St. Lawrence.	2 30	5	3	Mugeres Harb., Bay of Honduras.	9 30	1 $\frac{1}{2}$	
Mississippi, S. W. Pass, Gulf of Mexico.		1 $\frac{1}{2}$		Mull of Cantyre, Scotland	10 35	4	
Mistanoque, Labrador -	10 30	6	3	Mulroy Bay (Bar), Ireland	5 40	11 $\frac{3}{4}$	8
Mistley Quay, Stour R., England.	0 48	11 $\frac{1}{2}$		Mumbles Lt. House, Wales	6 1	27 $\frac{1}{4}$	20 $\frac{1}{2}$
Mobile, Gulf of Mexico	irr.	1-2		Mungalaum Id., China Sea, E. Coast.	11 0	5	
Mocha Island, Chile -	10 30			Mungullo or Mongallo R., Africa, E. Coast.	4 45	12	
Mocha Road, Red Sea, (E. Coast).	12 0	4 $\frac{1}{2}$		Murdounah Id. (E. Cst.), Red Sea.	6 0	3	
Mogador, Africa, W. Cst.	1 18	10-12		Murray Islands, Torres Strait.	9 30	10	
Molyneux Bay, New Zealand.	3 0	8	6	Murray Pass, Bass Strait	11 10	8	
Mombaza Port, Africa, E. Coast.	4 0	11		Musa Port, Babuyan Ida.		5	
Monach Ids., Scotland, W. Coast.	5 44	12 $\frac{1}{2}$	8 $\frac{1}{2}$	Mutlah River, (entrance to Biddah River), Bay of Bengal, W. Coast.	10 0	14	
Monckton (Railway), Bay of Fundy.	0 15	47	37 $\frac{1}{2}$	Mutlah (Muda Kali), Bay of Bengal, West Coast.	11 45	15	
Mondego (Bar), Portugal	2 30	7		Mutton Island, Ireland, W. Coast.	4 20	13 $\frac{3}{4}$	9 $\frac{1}{2}$
Monganui Harb., New Zealand.	8 15	9	7	Myggenæs Fiord, Færoe Islands.	9 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
Monomoy, United States	11 30	5 $\frac{1}{2}$	4	Naafe R., Bay of Bengal, E. Coast.	10 0		
Monrovia, Africa, W. C.	6 0	6		Naalsee Fiord, Færoe Islands.	4 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
Montauk Pt., United States.	8 20	2 $\frac{1}{2}$	2	Nafa-Kiang, Loo Choo Islands.	6 28	7	
Monterey, California -	10 22	4 $\frac{1}{2}$	3 $\frac{1}{2}$	Nagasaki Bay, Japan Sea.	7 15	9	7 $\frac{1}{2}$
Montgomery Isles, Australia, W. Coast.	12 0	36					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Nagore, Bay of Bengal, W. Coast.	8 15			New Bedford (entrance), United States.	7 57	4½	4
Namki Ids., China, East Coast.	8 30	17		— Castle, United States	11 53	7	6½
Namoa Island (Clipper Road), China, E. Coast.	11 15	7		— Haven, United States	11 16	6¼	5½
Namquan Harb., China, E. Coast.	10 0	17		— London, United States.	9 28	3	2½
Nanaimo Harb., Gulf of Georgia, Vancouver Id.	5 0	14		— Providence, S. W Bay, Bahamas.	7 30	4	
Nancowry Harb., Nicobar Islands.	9 15	8½		— Perlican Harbour, Newfoundland.	7 30	4	2½
Nangamessie Harbour, Sumba.	11 30	17	13½	— Rochelle, United States.	11 22	8½	7½
Nangka Id., Banka Strait		12		— Ross, Ireland -	6 4	12½	10
Nanoose Harbour, Vancouver Id.	5 0	15		— Year Sound, Tierra del Fuego.	3 30		
Nansaree River (Bar), Hindoostan, W. Coast.	3 0	18		— York, United States	8 13	5½	4½
Nantucket, United States	12 24	3½	3	Newburyport, United States	11 22	9	7½
Napoleon Road, Gulf of Tartary.	2 30	2½		Newcastle, Australia, E. Coast.	9 45	6-7	
Narrinda Bay, Madagascar, W. Coast.	4 30	15		— England -	4 23	10½	
Narrows (First), Magellan Strait.	9 0	36-42		— Ireland -	11 4	14½	12
— (Second), Magellan Strait.	10 0	23		Newhaven, England -	11 51	20	15
Naruto (Fukura) Japan Sea.	6 17	7		Newport, United States -	7 45	4½	4
Nash Point, Bristol Channel.	6 25	33	25	— Wales, (South Coast.)	7 10	39	29
Nasparte Inlet, Vancouver Id.	12 0	12		— (W. C.)	7 0	12	9
Nassau, New Providence, Bahamas.	7 30	4	3	New Quay, Wales -	7 30	15	
Nassau Bay, Tierra del Fuego.	4 0	6		Newton Stewart, Scotland, W. Coast.*	12 0	12	6
Natal Port, Africa, S. C.	4 30	6		Nhatrang Bay, China, W. Coast.	8 30	5½	
Naturaliste Channel, Sharks Bay, Australia, N.W. Coast.	11 45	6		Nicholas, St., Harb., G. St. Lawrence.	1 55	12	7
Navallo Port, France -	3 42	13	9¾	— Port, Peru	5 15	3	
Nazaire, St., France -	3 40	15½	11	Nicholson Port (Lambton Harbour) New Zealand.	4 30	5	3
Naze, The, England -	12 6	12½	10	Nicobar Id. (Nancowry Harb.), Indian Ocean.	9 15	8½	
Nee-ah Harbour, Oregon	12 33	7½	6¾	Nicolas, St., Bay, Magellan Strait.	2 6		
Needles Point, England -	9 46	7½	5	Nicoya Gulf (Port Herradura), Cent. America.	3 9	10	
Negapatam, B. of Bengal	5 0	3		Nieuport, Belgium -	12 18	16	13
Negro Harbour, Nova Scotia.	8 12	7	5¾	Nieuwediep, Netherlands	7 27	4	3½
Negro River, Patagonia	11 0	14		Niger River (Nun entrance), Africa, W. Coast.	4 8	6	
Nelson, New Zealand -	9 50	14	10	Nikolskoi Chan., White Sea.	5 25	3	
— Port, Australia, N.W. Coast.	12 0	27		— Twr., White Sea	6 0	2	
Neuf Port, Gulf St. Lawrence.	2 10	13	8	Nimrod Sound, China, E. Coast.	10 30	20	
—, River St. Lawrence.	8 30	14	9	Ninepin Group, China E. Coast.	10 0	5	
Neville Port, Vancouver Id.	0 30	17		Ning-hai, Yellow Sea -	12 0	6	
				Nin-po-fu, Yung River, China E. Coast.	1 0	9	
				Nisqually, America, N.W. Coast.	6 0	18	15
				Noamh Island, Scotland	5 2	11½	7
				Noel, Bay of Fundy -	12 41	50½	43½

* At Carty Quay.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Nir Island, Tierra del Fuego.	2 30	5		One Fathom Bank Light, Malacca Strait.	6 0	15	12
Nirmontier, France -	3 2	16	11½	Onega River, White Sea	9 17	6-7	
Nolith Port, Africa, S.W. Coast.	2 30	5½		Ooloogan Bay, China Sea, E. Coast.	9 30	5½	
Nootka Sound, Vancouver, Id.	12 0	12		Oonting Port, Loo Choo Islands.	6 35	8	
Norderney, Germany -	10 30	8		Oösima, Japan Sea -	6 50	5	
Nore, England -	12 30	15½	13	Oporto, Portugal -	2 30	10	
Norfolk Island, S. Pacific	7 45	7		Orange B., T. del Fuego	3 30	5	
North Balabac Strait, China, E. Coast.	10 50	5		—Cape, Magellan Strt.	3 0		
North Cape, C. Breton Id.	8 0	4		Orford Haven (Bar), England.	11 30	7½	
— Edisto River, United States.	7 10	7	5½	— Port, California -	11 26	6¾	4¾
North Harbour, Newfoundland.	8 0	7½	5	— Quay, England -	12 30	7½	
— Sands, Malacca Strait.	5 30	15	12	Orfordness, England -	11 15	8	6½
Noss Island, Madagascar	5 0	15		Orinoco River (entr.) Guayana.	6 0	3	
Nova Zembla Harbour, Lapland.	6 36	10		Orleans Id., R. St. Lawrence.	5 40	17	13
Nuchatlitz Inlet, Vancouver Id.	12 0	12		Ormond, Kenmare River, Ireland.	3 43	10	7½
Nuevo Gulf, Patagonia, E. Coast.	7 0	10		Ornsay, I. of Skye -	5 50	14½	10½
— Port, Central America.	3 10	12		Orlov Letni C., White Sea.	5 18	4	
Nukulan Port, Fijii Ids.	6 47	5¾		Os Ilheos, Brazil -	4 30		
Nuna-choa, Comoro Ids.	3 0	14		Osaki, Japan Sea -	5 55	6½	
Nunez River, Africa -	10 0	15	11½	Oscuro Cove, Patagonia, W. Coast.	0 55	20	
Nyminde Gab, Jutland -	2 41	2		Osprey Reef, Australia, E. Coast.	8 36	6	
Nysna Harbour, Africa, S. Coast.	3 45	5		Ostend, Belgium -	12 25	19	15
Oban, Scotland -	5 22	12	9½	Otago Har., New Zealand	2 50	7	5
Obb of Harris, Isle of Harris, Scotland.	6 16	11½	8½	Otaheite, South Pacific -	noon	1½	
Observatory Id., China Sea, E. Coast.	11 0	5½		Otterswick, Orkneys -	9 13	11	8
Oracocke Inlet, United States.	7 4	2½	2	Otway Port Patagonia, W. Coast.	11 37	6	
Octavia Bay, New Granada.	3 30	13		Ou ou Kinsh Inlet, Vancouver Id.	12 0	12	
Oclar Cape, Banka Strait	6 30	12		Ounalashka Id., America, N.W. Coast.	7 30	7½	
Oho Sima, Loo Choo Ids.	7 30	5½		Ouro R., Africa, W. Cst.	12 0	8-9	
Obo Harb., Africa, E.C.	4 15	6		Ower Shoal, England, East Coast.	6 30		
Oaveaga, Bilbao River, Spain.	3 15	12		Oxbaasheia, Svec Fiord, Norway.	12 0	8	
Old Pt., Comfort, United States.	8 17	3	2½	Oyster Bay, United States	11 7	9½	8
Old Providence, Bay of Honduras.	irr.	1		Oystreham, France -	9 38	21	16
Olenji Islands, Lapland -	7 30	12		Packsaddle Bay, Tierra del Fuego.	3 30	6	
Oleron, Ile d', France -	3 50	19		Padstow, England -	5 13	20½	16½
Omaider Island (Gulf of Akabah), Red Sea.	6 0	4		Pagham (entrance), England.	11 30	16½	12½
Omnary R., Hindoostan, W. Coast.	1 45	18		Paimpol, France -	6 0	31	23½
Omonville, France -	7 29	15½	12½	Palais, Port le, Belle Ile, France.	3 18	14½	10½
Om-ras-Masirah, Arabia, S.E. Coast.	10 0	10		Palliser Cape, New Zealand	6 0	6	
				Palma, Canary Ids. -	12 30?	9?	
				Palmas Cape, Africa, W. Coast.	4 30	4	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Palmedo Road, Sumba Id.		15		Pelorus Sound, New Zealand.	9 35	11	7
Palmeira Point, Ceylon -	9 30	7-11		Pemba Channel, Mozambique.	4 0	11	
Paloan Bay, Mindoro -		5		—— Id., Mozambique	4 15	12	
Pamarung Ids., Borneo, E. Coast.		8-10		Pembroke Dockyard, Wales.	6 12	21	15½
Pampang Bay, Java -		7-3		Penang, Malacca Strait -	12 0	9	7½
Panama Road, Central America.	3 23	15-22	10-16	Peñas Cape, Tierra del Fuego.	6 2	12	
Pancol, China Sea, E.C.	9 40	6		Pender Harb., Strait of Georgia, B. Columbia.†	6 0	13	
Pansand Hole, England -	12 0	15½	13	Peniche, Portugal -	1 54		
Paposo, Chile -	9 40	5		Penmark Rocks, France	3 16		
Paquique Cape, Bolivia -	9 45			Pennington R., Bight of Benin.	4 15	5	
Para, Brazil, N. Coast -	12 0	11		Pensacola, G. of Mexico		1½	
Parahiba, Brazil -	5 0	9-12		Pentillie, R. Tamar, England.	5 55	13½	9½
Parenga-renga Harbour, New Zealand.	7 54	7		Pentland Firth, Stroma, S. Side.	9 47	9	6½
Parida Id., New Granada	3 15	10½		—— Swona, E. Side	10 24		
Parsboro, Bay of Fundy	12 17	43	37½	—— W. Side	9 35		
Pasado Cape, Ecuador -	3 30	10		—— Great Skerry, E. Side.	11 4	9½	6
Pasages Port, Spain -	3 0	12	9	—— W. Side	10 53		
Passage or Culebra P., Caribbean Sea.	9 0	1		Penzance, England -	4 30	16½	12½
—— Id., Banda Sea -	noon	6		Percy Isles, Middle or No. 1 Id.	10 30	16	13
Passandava Bay, Madagascar, W. Coast.	5 0	15		—— South or No. 2 Islet, Australia, E. Coast.	10 30	14	
Patapsco R. (Bodkin Pt.) United States.	5 42	1½	1	Perim Id., G. of Aden -	12 0	7	
Paterson Port, Australia, N. Coast.	4 0	16-24		Pernambuco, Brazil -	4 45	8-6	
Patersons Inlet, New Zealand.	1 10	5	6	Peros Banhos, Indian Ocean.	1 30	5	
Patrick Port, Scotland -	11 10	15	12	Perouse, La, Strait, Japan Sea.	10 30	6	
Patta B., Africa, E. Cst.	4 30	10		Perron Cape, Sharks Bay, Australia, N.W. Coast.	12 45	5½	
Patteson Port, Vanu Lava Id., Banks Ids.	6 40	5		Perth, Scotland -	3 35		
Paul de Loanda, San, Africa, S.W. Coast.	4 30	5		Perula Bay, Mexico, W. Coast.		7	
Paul St. Id., Indian Ocean	11 0	3		Pescadore Ids. (Makung Harb.), China Sea.	10 30	9½	7
—— G. St. Lawrence	8 0	5	3	Peter, St., Bay, C. Breton Island.	7 30	6	4
Paumben Pass, Bay of Bengal, W. Coast.	1 30	2		—— Harb., Prince Edward Island.	8 30	4	2½
Payta Port, Peru -	3 20	3		Peterhead, Scotland -	0 34	10½	8½
Pearce Point, Australia, N. Coast.	6 55	20	26	Petit Passage, B. of Fundy	10 41	22	15
Peckett Har., Magln. Strt.	12 0	6		Petit Port, B. of Islands, Newfoundland.	10 42	5½	
Pedro Gonzales, New Granada, (Trapichi Island).	3 50	16		Petrel Bay, St. Francis Isle, Australia, S. Coast.	12 0	6	
PedroSan., Pass, Patagonia, W. Coast.	0 30	9		Petucura Rock, Patagonia, W. Coast.	0 50	16	
—— San Bay, California	9 39	4½	3½	Pheasant Point, Wusung River, China, E. C.	0 35	13	8
Peel, Isle of Man -	11 8	16½	13	Philadelphia, U. States -	1 18	6½	5½
Pegasus Port, New Zealand	11 50	8	6				
Peh-tang-ho, Yellow Sea	3 33	10	7½				
Pei-ho or Peking River (entrance), Yellow Sea.*	3 40	10	7½				
—— (Tien-tsin)	7 0	4½					
Pelew Islands, N. Pacific		6					
Pelican Lagoon, Kangaroo Id., Australia.	5 0	6					

* Time and rise much affected by winds.

† From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Philip B., E. side, Magellan Strait.	9 30	24		Plymouth Breakwater, England.	5 37	15½	11½
Philip Port, } Lonsdale } Australia, } Point }	9 42	7	5½	—— (Sutton Pool)	5 32	15½	11½
—— S. Coast.				—— United States	11 19	11½	10½
—— Queens Cliff	10 50	3	2	—— New, New Zealand.	9 30	12	9
—— Nepean Point	10 53	2½	1½	Pomba B. Africa, E. Cst.	4 0	15	11
—— Dromana	2 19	3	2½	Pomquet, Nova Scotia -	9 15	4	2½
—— Schnapper Pt.	2 14	2½	2	Ponga River, Africa, W. Coast.	7 30	12	9½
—— Bellarine Jetty	2 21	2½	2	Poolbeg Lt. Hse., Ireland	11 12	12-14	9-11
—— Harvey Point	2 39	3	2½	Poole, England -	{ 9 10 } 12 45	{ 6½ } 6½	{ 4½ } 4½
—— Geelong -	2 30	3½	2½	Poolewe, Loch Ewe, Scotland.	6 39	14½	10½
—— Williamstown	2 31	2½	2	Pootoo Island, China, E. Coast.	8 15	12	
—— Melbourne -	2 48			Poqueldon Harb., Patagonia, W. Coast.	0 54	18	
Piankatank R. (Cherry Point), United States.	10 5	2	¾	Portaferry, Ireland -	12 0	18-21	12-16
Pichidangu Bay, Chile -	9 20	5		Port-au-Choix, Newfoundland.	10 47	5	
Pictou Har., Nova Scotia	10 0	6	4	Port au Prince, Saint Domingo.	8 0?	1?	
Pidice Bay, Lombok -		10-12		Port-en-Bessin, France -	8 57	20	15½
Pal Harbour, England -	11 5	28	21	Portchester, England -	11 46	13½	10½
Perre, St., Newfoundland	8 33	6½	4½	Portendik, Africa, W. C.	10 0	6	
—— Island, China Sea, E. Coast.		4		Porth Cawl, Wales -	6 8	28½	21½
Pigeon Bay, Yellow Sea	11 45	8		Porth-dyn-lleyn, Wales	8 30	16	
Pikishan Ids., China, E.C.	8 30	17		Portishead, England -	7 16	41½	31
Pillar C., Magellan Strt.	1 0			Portland Inlet (Salmon Cove) America, N.W. Coast.	1 8	16	
—— Cape, Tasmania -	1 0	6		—— United States	11 25	10	8½
Pillars, R. St. Lawrence	5 0	17	10	—— Bay, Australia, S. Coast.	Midnight.	4	
Pimlea Harb., Africa, E. Coast.	4 30	12		—— Breakwater, England.	7 1	6½	4½
Pinas Bay, New Granada	3 15	14		Porto Frio, Brazil -	2 40	4½	
Pinnill, Orwell River, England.	12 20	12		Porto Praya, C. Verde Ids.	6 0?	5	
Pio Quinto Port, Babuyan Islands.	6 0	6		Portree, Isle of Skye -	6 32	15	10½
Prie Port, Spencer Gulf, Australia, S. Coast.	7 15	9-11		Portrieux, France -	6 0	31	28½
Pisco Bay, Peru -	4 50	4		Portsbridge (Portsmouth) England.	11 48	6½†	4
Pti Palena, Patagonia, W. Coast.	12 23	10		Portsmouth Dockyard, England.	11 41	12½	10
Pty, Hindoostan, W. C.	10 5	9		Portsmouth, United States	11 23	10	8½
Piacentia, Newfoundland	9 15	8		Possession Bay, Magellan Strait.	9 0	36-42	
Plank Point, Spencer Gulf, Australia, S. Coast.	6 15	6-8		—— Cape, Torres Strait.	9 0	6	
Playa de Incia, Cuba -	7 31	2½		—— Id., Torres St.	1 0	9½	
Playa Marie Bay, California.	9 20?	7-9?		Post Office Island (Charles Island), Galapagos.	2 10	6	
Playa Parda Cove, Magellan Strait.	1 8			—— Id., Torres Str.	1 0	9½	
Pleasant Port, Falkland Islands.	5 0	6½		Pouinipet Island, Caroline Islands, N. Pacific.	6 0	4½	
Plettenberg Bay, Africa, S. Coast.	8 10	6		Poulamente B., Madame Id., C. Breton Id. -	7 50	6	4
Poughrescan, France -	5 17	25½	18½	Poulton-le-Sands, England	11 26	27½	21½
Poumanach, France -	5 15	24½	18½				
Pumper Cove, Howe Sound, G. of Georgia, British Columbia.*	noon.	12					
—— Sound (Fane Id.), Vancouver Id.	irr.	12					

* From observations made in the month of October.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Poverty Bay, New Zealand	6 5	6		Queen Charlotte Sd. (entrance), New Zealand.	8 50	8	6
Pratas Shoal, China Sea	4 0	5		Queensferry, Firth of Forth, Scotland.	2 37	18	14
Preservation Inlet, New Zealand.	11 20	8	6	Queenstown, Ireland -	5 1	11½	9
Preston, England -	11 49	10	4½	Quelan Cove, Patagonia, W. Coast.	0 28		
Prince Frederick Harb., Australia, N.W. Cst.	12 0	28		Quentin, Port San, California.	9 5	9	
Prince Regent River (St. George Basin) Australia, N.W. Coast.	12 20	24-37		Quicavi Bluff, Patagonia, W. Coast.	0 57	20	
Prince of Wales Strait, Banks Land.		3		Quicks Hole (S. side), U.S.	7 36	3½	3½
Princes Id., Bight of Biafra	3 45	4½		(N. side) -	7 31	4½	3
Princess Royal Harbour, Australia, S. Coast	11 56	1-4		Quilca River, Peru -	8 0	6	
Prospect River, Nova Scotia.	7 43	7	6	Quilimane R. (entrance), Africa, E. Coast.	4 15	16	
Prony Bay, New Caledonia.				Quillebœuf, France -	10 6	9½	7½
Provincetown, U. S. -	11 22	10¾	9½	Quiloa, Africa, E. Coast	4 45	12	
Pubnico (Beach Point), Bay of Fundy.	9 25	12	10	Quoile Quay, Strangford, Ireland.	12 45	11	9½
Puerto Bueno, Patagonia, W. Coast.	1 40			Rabat, Africa, W. Coast	1 46	9-12	
Puerto de Baitiqueri, Cuba.	9 7	2½		Race, Cape, Newfoundland.	7 0	6½	5
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	10		Rachada Cape, Malacca St.	5 30	13	
Puerto de Maravi, Cuba	7 56	2½		Radama Port, Madagascar, W. Coast.	4 40	13	
Puerto de Mata, Cuba -	6 49	2½		Ragged Id., Sumbawa, Java Sea.	8 10	3	
Puerto de la Plata, St. Domingo.	7 30	3?		Point, Borneo, E. Coast.		7	
Puerto de Taco, Cuba -	8 49	2¾		Raine Id., Torres Strait	8 10	10	
Puget Sound (Nisqually), America N.W. Coast.	6 0	18	15	Rajahpoor Harb., Hindoostan, W. Coast.	11 0	12	
Pugwash Har., Nova Scotia	10 30	7	4	Rajang River, Borneo -	4 45	13	9
Pulaski Fort, United States	7 20	8	7	Ramos R., Bight of Benin	4 20	5	
Pulicat Shoals, Coromandel Coast.	9 25	2¾		Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Pulo Aor, Sumatra, N.E. Coast.		5		Ramsay Sound, Wales -	6 0	17	
Pulo Condore, China Sea, West Coast.*	2 30	6½		Ramsey, Isle of Man -	11 12	19½	16
Pulo Leat, Gaspar Strait	2 30	4		Ramsgate, England -	11 44	15	12
Pulo Mendanao, Gaspar Strait.	2 30	4		Ramso Fiord, Norway -	10 45	7	
Pulo Panjang, G. of Siam	7 0	2		Rangoon, Bay of Bengal, E. Coast.	5 30	21	14
Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½		R. (entrance) B. of Bengal, E. Coast.	3 15	21	14
Puluqui Id., Patagonia, W. Coast.	1 5			Raoul or Sunday Island, S. Pacific.	6 0	5	
Puna Island, Ecuador -	6 0	11		Rappahannock (Saunders Wharf), United States.	3 2	2¾	2
Par Bunder, Hindoostan, W. Coast.	9 45	6		Rás Hafún, Africa, E. C.	6 15	4	
Pwlheli, Wales - -	7 46	13¾	9¾	Rás Jerdaffoon. See Guardafui Cape.			
Quaco, Bay of Fundy -	11 35	30	25	Rás Mohommed (Gulf of Akabah), Red Sea.	6 0	5	
Quatsino Sound, Vancouver Id.	11 0	11		Rás Sharmah, Arabia, S.E. Coast.	9 0	8	
Quebec, R. St. Lawrence	6 38	18	13	Rás-al-Kheimah, Persian Gulf.	11 45	7	
Queda, Malacca Strait -	12 0	5½		Rás-al-Asídah } Arabia {	8 30	5½	
				Rás Shébali } S. E. {	10 0	10	
				Rás-al-Hed } Coast {	9 30	9	

* From a French survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rathmullan, Ireland -	5 42	12½	9	Roche Harbour, Haro Strait.	irr.	12	
Raujpoor (G. of Cambay), Hindoostan, W. Coast.	2 15	18	13	Rochefort, France -	4 6	17	13
Realejo, Cent. America	3 6	11		Rochelle, France -	3 31	17	13
Reconlavi Inlet, Patagonia, W. Coast.	0 44	14		Rockport, United States -	10 57	10½	8
Red Bay, Ceylon, South Coast.	2 20	2½		Rockall, N. Atlantic -	3 30	12	
— (Pier), Ireland	10 31	4	4	Rocky Id., G. of Siam -	4 0	4	
— Labrador -	7 45	3½	1½	Rodrigue Id., Ind. Ocean	1 45	6	
— Id., Durian Strait -	5 0	10½		Roebuck Bay, Australia, W. Coast.	0 30	30	18
Redbridge, England -	{ 10 42 12 57 }	{ 8½	6	Romania Point (Malay Penin.), China Sea, W. Coast.	10 30		
Refuge Cove, Bass Strait	12 5			Romdals Ids., Norway -	10 45	6	
Régneville, France -	6 20	35	26	Rona (South) Light, Scotland.	6 20	14½	10½
Reikiavik, Iceland -	5 0	17½	13½	Roodewall Bay, Africa, S.W. Coast.	2 30	6½	
Rendezvous Id., Borneo, S.W. Coast.		8		Roque, Cape St., Brazils		10	8
— Strait of Georgia.	7 0	14		Roscoff, France -	4 46	23	17½
Rendsborg, Denmark -	7 42	4		Rosel, Jersey, English Channel.	6 15	30	21½
Renfrew, R. Clyde, Scotland -	1 15	9		Roshnoff Cape, America, N.W. Coast.	7 30	15	
Resolution B., Marquesas	2 30	4		Rota, Spain -	1 24	12½	8
— Port, Tanna Id.	5 35	3		Rotterdam, Netherlands	3 45	7	
Reunion Id., { (St. Pierre)	noon.	3½		Rottneft Id., Australia, W. Coast,	7 50	2½	
Indian O. { (St. Denis)	0 22	2½		Rouen, France -	2 28		
Reunion Id., { (St. Gilles)	1 0	2½		Rouge Harbour, Newfoundland.	7 0?	2-4?	
Indian O. { (St. Paul)	1 7	4		Roundstone, Ireland -	4 28	13½	10½
Rewa Road, Fijii Islands.				Rovama River, Africa, E. Coast.	4 0	16	11½
See Nukulan Port.				Royal Harbour, Ruatan, Bay of Honduras.	7 45	3½	
Rhio, Rhio Strait -	10 0	7	5	Royal Island, Bahamas -	7 45	3½	
Ribble Lighthouse, England.	10 51	24	17	Royal Port, Jamaica -	11 0	1	
Richibucto R., Gulf St. Lawrence.	3 30	4	2½	Royalist Port, Palawan, E. C.	11 0?	6½?	
Richmond, United States Harb., Prince Edward Island.	4 28	3½	2½	Royan, France -	3 38	13½	10
— R., Australia, E.C.	6 0	3	2	Ruapuke Id. (Foveaux St.) New Zealand.	1 0	8	6
Rio de la Plata, Cape Castillos.*	8 30	2		Rugged Id., Bahamas -	8 0	3	
— Buenos Ayres.	12 0	3-5		— Nova Scotia	7 59	7½	6
— Barragan Bay, S. America, E. C.	7 0	5-9		Ruggles B., Falkland Ids.	7 30	5	
Rio Grande do Sul, Brazil.		1½-2		Rush Port, Ireland -	6 8	5½	3½
Rio Janeiro, Brazil -	3 0	4	3	Rutland Id., Ireland, W. Coast.	5 22	11	8
Rio Negro, Patagonia, E. Coast.	11 0	14		Ryde, England -	11 20	13½	
Rio Nunez, Africa, West Coast.	10 0	15	11½	Rye Bay, England -	11 20	22	17½
Ristegouche R., Campbelltown, G. St. Lawrence.	4 0	10	7	Sabine Pass, G. of Mexico		1½	
Rivadeo, Spain, N. Coast	3 0	15		Sable Cape (Clam Point), B. of Fundy.	8 27	8½	6½
Rivoli B., Australia, S.C.	10 0	4		— (Clarkes Harb.), B. of Fundy.	8 58	11	9
Rocas, Atlantic -	5 15	10		Sable Island, N. side, Nova Scotia.	7 30	4	
Roche Cape, R. St. Lawrence.	9 30	6	4	Sable Island, S. side, Nova Scotia.	6 30	4	

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
Sables d'Olonne, Les, France.	h. m. 3 26	ft. 14	ft. 10	Sandy Cove, W., Bay of Fundy.	h. m. 10 47	ft. 23	ft. 19
Saboga, New Granada -	1 9	14		Sandy Hook, United States	7 29	5½	5
Sabon Id., Durian Strt. -		10		— Id., Madagascar, W.C.	5 0	15	
Sacred Bay, Newfoundland	7 23	2½		— Islet, Australia, W. Coast.	10 35	18	
Sacrificios Prt., Mexico, W. Coast.	3 15	6		Sang-tau Bay, Yellow Sea.	0 55	7	4½
Saddle Id., East, China, E. Coast.	11 0	14		Sanguiana (entrance) Ecuador.	4 10	9	
Sado (Yebisu), Japan Sea	5 0	2		Sanguir Island, Moluccas		6	
Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8	Sangwin R., Africa, W. Cst.	5 15	4	
Saguenay, Tadousac, G. St. Lawrence.	2 45	17	10	Sanmoon Bay (St. George Island), China, E. Coast.	10 20	15	
Saigon (C. St. James) -	11 0	8		San-shui, Si Kiang, China, E. Coast.		5-6	
— (Saigon City), Cochin China.	5 30	9½		Santa Catalina Id., California.	9 35?	5?	4?
Saintes, Caribbean Sea -	6 45			Santa Cruz R., Patagonia, E. Coast.	9 30	40	29
Sal, C. Verde Ids., Africa, W. Coast.	7 45	5		Santa Cruz or Agadir, Africa.	12 45	9	
Salango Id., Ecuador -	12 41	12		Santa Island, California	9 35?	5?	4?
Salcombe, England -	5 41	15	11½	— Tenerife, Canary Is.	1 30	8	
Saldanha B., Africa, W.C.	2 0	6		Santa Maria Island, Chile	10 20	6	
Sale Macowa, Red Sea -	0 30	2		Santander, Spain -	3 30	15	12
Salem, United States -	11 13	10½	8	Santiago de Cuba, Cuba	8 33	2½	
Salm R., Africa, W. Cst.	8 10	6		Santona, Spain -	3 30	12½	10½
Salmedina Rocks, Spain	1 27	12½	8	Saparooa Id., Moluccas -		6	
Salomon Ids., S. Pacific	6 45	2		Sapie Bay, Sumbawa -	1 0	10	
Saltasb, R. Tamar, England.	5 45	15	11	Sarawak R. (Moratabas entr.)	4 0	9	5½
Salt Cay Anchorage, Bahamas.	8 15	4	3	— Santubong (entr.)	4 0	10	6
Saltees, St. George's Channel.	5 40			— Sarawak Junction	5 0	15-18	9
Salvador, San, Port, Falkland Islands.	8 10	8		— City - Borneo, W. C.	5 20	15-18	9
Samanco B., Peru -	6 30	2		Sarn Badrig or the Causeway, Wales.	7 30	13	
Sambilangs, Malacca St.		12	10½	Sarn-y-hwch Reef, Wales	7 40	14	
San Francisco (North Beach), California.	12 6	4½	3½	Sau-o Bay, Formosa -	10 0	3½	
San Bartholomew Port, California.	9 10?	7-9?		Saugor Id., B. of Bengal		12	
San Blas, Mexico, W. C.	9 41	6½		Saumarez Reef, Australia, E. Coast.	8 0	6	
San Juan (anchorage), California.	9 40?	5		Savannah (city), U. S. -	8 13	7½	6½
— del Sur, Central America.	3 8?	10?		— (entrance,) U.S.	7 20	8	7
— River, New Granada -	6 0	12		Scales Point, Blackwater River, England.	12 0	14½	10
San Lucar, Spain -	1 53	12½	8	Scalloway, Shetland -	9 30	5½	4½
San Miguel, California -	9 25	5	4	Scarborough, England -	4 11	15½	12½
San Rosa Id., California	9 30?	5?	4?	Scarcies Rivers, Africa, W.C.	7 10	10	
Sand Cay, United States	8 40	2	1	Scarnish, Tiree Id., Scotland.	5 31	12	9
Sandalwood Bay, Fijii Ids.	6 0	6?		Scilly (St. Agnes Id.) -	4 30	16	12
Sand Point, G. of Liautung, Yellow Sea.	4 50	7	5½	— (St. Mary Id.), England.	4 18	15½	11½
Sands Pnt., United States	11 13	9	7½	— Trescow -	4 22	16½	12½
Sandwich Port, Malicolo Id., Banks Ids.	5 30	4		Sea Bear Bay, Patagonia, E. Coast.	12 45	20	
Sandy Cape, Australia, E. C.	7 50	6-8		Seaforth Loch, Athline, Scotland.	6 16	15	10
— Cove, E., B. of Fundy	10 33	21½	17½	Seaham, England -	3 24	14½	10½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Seal Cove, Grand Manan, B. of Fundy.	10 54	20	15	Shediac Harbour, New Brunswick.	1 0	4	2
Seal Id., C. Sable, Bay of Fundy.	9 49	12½	10½	Sheephaven, Ireland -	5 32	11½	8½
Seamount Bay, Mulroy B., Ireland.	6 44	7½		Sheerness, England -	0 37	16	13½
Sebastian, San, Brazil -	2 0	4		Sheet Harb., Nova Scotia	8 6	6½	4½
— Tierra del Fuego	7 0			Shfeen Island, Africa, S.C.	4 40	12	
Sebastin, Spain, N. Coast	3 0	12	9	Sheffield Island, U. States	10 58	8½	7½
Seidashigur Bay,* Hindoostan, W. Coast.				Shelburne, Nova Scotia -	8 4	7	5½
Sedili R., China Sea, W.C.	9 44	7		Sheldrake Island, Gulf St. Lawrence.	6 0	5	3
Sein, Isle de, France -	3 21	17½	12	Sherbro R., Africa, W.Cst.	6 0	11	
Seleney Bay, Lapland -	7 9	9		Shields, North, England	3 23	13½	10
Selsea Bill, England -	11 45	16½	12½	Shihtan Bay, Yellow Sea	1 30	9	7
Semiamoo Bay, Gulf of Georgia, America, N.W. Coast.	2 0	12		Ship Harb., Nova Scotia (New Id.), Falkland Islands.	7 54	6½	4½
Senegal (Bar) -	8 42	6		Shippigan, Gulf St. Lawrence.	10 30	5½	3
— (Guet N'dar) -	8 42	6		Shoal Bay, Australia, N.C. E. Coast -	3 42	18-25	14-20
— (St. Louis), Africa, W. Coast.	10 0	6		Shoal Water B., Australia, E. Coast.	8 30	12-18	
Serrana Bank Mosquito Coast.		2		Shoreham, England -	10 30	18	13½
Serranilla Bank, Mosquito Coast.	irr.	2		Shushartie Bay, Vancouver Id.	11 34	12	
Sesham Islands, Hang-chu Bay, China, E. Coast.	11 45	14		Si Kiang or West River, China, E. Coast:			
Sesbal, Portugal -	2 30	8	11½	— (San-shui) -			5-6
Seudre, River, (entrance,) France.	3 31	15		— (Shao-king) -			3
Serebelle Archip. (Mayhé Is. (Indian Ocean).	4 0	6½		— (Wuchan) -			1-1½
Seypan Id., Ladrone Ids.	6 45	2½		Siak River, Malacca Strt. off the town -	9 0	12	
Seven Islands, Lapland -	8 20	12	5	Sidmouth Cape, Australia, E. Coast.	9 15	11	
— Bay, Gulf St. Lawrence.	1 40	9	8	Sierra Leone, Africa, W.C.	7 55	8	
Sha-lui-tien Banks (west part), Yellow Sea.	2 50	10		Sillebar R. (Bar), Sumatra	6 0	4½	
Shab Kadún, Arabia, S.E. Coast.	9 20	10		Simidsu, Japan Sea -	7 30	7	
Shibbu-saifeh, Arabia, S.E. Coast.	9 45	10		Simoda Port, Japan Sea	5 0	3-5	
Shallow Harb., Falkland Ids.	9 30	6	7	Simonoseki, Japan Sea -	8 30	8	6
Shanghai, Yang-tse-Kiang, China, E. Coast.	0 40	10		Simons Bay, Africa -	2 44	5½	3½
Shao-king, Si Kiang, China, E. Coast.		3		Simons St., Island, U.S.	7 43	8½	6½
Sharja, Persian Gulf -	1 0	6		Simpson Port, N.W. Coast of America.	0 35	21½	14½
Sharks Bay, Naturaliste Channel.	11 45	6		Singapore, New Harbour, Malacca Strait.	9 45	10	7½
— Denham Id.	12 5	5		Sinou, Africa, W. Coast -	5 0	4	
— Freycinet Reach.	3 0	5		Sir C. Hardy Ids., Torres Strait, E. Coast.	9 15	10	
— Freycinet Estuary.	4 15	3½		Sir E. Pellew Islands, Australia, N. Coast.	7 30	4-7	
— Cape Perron	12 45	5½		Sisal, Gulf of Mexico -		2	
— Hamelin Pool	5 0	3½		Sitka, America, N.W.C.†	0 34	5-7	
— Australia, N.W. Coast				Skaapen Fiord, Færø Islands:			
				Between Stormoe and Sandoe.	5 0	9½	7½
				Between Hestoe and Sandoe.	5 30	9½	7½
				Skagen or the Skaw, Jutland.	5 56	1	

* Spring tides rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

† The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation, (1862,) the local pilots say that the rise sometimes is as much as 16 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Skerry, Great, E. side, Pentland Firth.	11 4	9½	6	Spicers Cove, B. of Fundy	11 35	37	30½
Skerry, Great, W. side, Pentland Firth.	10 53			Spider Id., China, E. C. -	10 0	17	
Skerries, Ireland, N. Cst.	6 15	5	3	Spitzbergen (Bell Sound)	8 56	3½	
Skerries, E. Coast. -	11 0	13	10	Spurn Pt. (Humber R.), England.	5 26	18½	15
Skip Ness, Scotland -	11 50	9		Staten Island, Tierra del Fuego.	4 30	8	
Skull, Ireland - -	4 2	9½	7½	Staunton Id., Yellow Sea	1 30	8	5½
Slaughden, Orford, Eng- land.	1 0	7½		Steilacoom Fort, Oregon	4 46	11	5½
Slievebane Bay Ireland, W. Coast.	5 49	10½	7½	Stephen Port, Australia, E. Coast.	9 0	6	
Sligo Bay (Mullaghmore) Ireland.	5 18	11½	8½	----- Falkland Islands.	7 45	7½	
----- Harbour, Ireland	5 23	11½	8½	Stewart Harbour, Tierra del Fuego.	2 50	4	
Slyne Hd., Ireland, W.C.	4 30	13½	10	Stirling, Firth of Forth, Scotland.	3 52	7½	4½
Smalls Lighthouse, St. Georges Channel.	6 0	21		Stirrup Cays, Bahamas -	7 0	4	
Smerwick, Ireland -	3 50	11½	8	Stockton ('Tees'), England	4 40	11	
Smithville, United States	7 19	5½	4½	Stonefield (Loch Etive), Scotland.	7 3		
Smoky Bay, Australia, S. Coast.	12 15	6		Stonehaven, Scotland -	1 10	14	11
Smyth Harbour, Tierra del Fuego.	12 0	6½		Stonington, United States	9 7	3½	3
Snape Bridge, Orford, England.	3 0	6		Stornoway, Lewis Island, Scotland.	6 46	13	9½
Socoa, France - -	3 19	12½	8½	Strangford (Killard Point), Ireland.	10 53	14	11½
Society Bay (Sullivan Bay), Yellow Sea.	0 15	8		----- Quay - -	12 31	10½	8½
Socotra Id., Indian Ocean	7 20	8		----- Head of Lough (Turley Rocks).	12 44	11½	9½
Sofala R., Africa, E. Coast	4 0	19		Streaky Bay (Blanche- port), Australia S. C.	1 0	5	
Solitary Ids., Australia, E. Coast.	9 15	5	3	Stroma, S. side, Pentland Firth.	9 47	9	6½
Solovet Road, White Sea	5 0	4		Stromness, Orkneys -	9 0	10	7½
Solway (Tarn Point), Scotland.	11 22	23	18	Stuart Island, Strait of Georgia.	6 0	12-14	
Sosnovaia Bay, White Sea	2 40	6		Sturge Passage, Strait of Georgia.	6 0	12	
Sosnovets, White Sea -	11 44	18		Suadiva Atoll, Maldives	1 0	4	
Souma, White Sea -	6 30	5½		Sual Port, Luzon - -		6	
South Farallon, California	10 37	4½	3½	Suderoe Fiord, Færoe Ids.	6 0	9½	7½
South Rock, Ireland	10 58	13	10½	Suez Bay (head of Gulf), Red Sea.	2 0	6	
Southampton, England -	{ 10 30 12 45 }	{ 13 }	{ 9½ }	Sughrá, Arabia, S.E. Cst.	8 0	6	
South West Bay, New Providence.	7 30	4		Sumburgh Head, Shetland	9 45		
----- Cape, N. Zealand	12 0	7	5	Sunday or Raoul Island, S. Pacific.	6 0	5	
Southernness, England -	11 20	28		Sunderland, England -	3 22	14½	11
Southwold, England -	10 20	6½	4½	----- N., England -	2 30	15	1½
Spain, Port, Trinidad -	4 30	4	3	Supé Bay, Peru - -	4 50	3	
Spensers Anchorage, Bay of Fundy.	11 42	39	33	Surat, Hindoostan, W. C.	4 0	19	
----- Bay, Africa, S.W. Coast.	10 50	5-6		Surin, St., France - -	4 11	14½	11
Spenser Gulf, (Thorny Passage,) Australia, S. Coast.	12 0	6-8		Surinam, Guayana -	6 0	5½	
----- Point Lowly -	7 0	6-8		Sussex Port, Falkland Ids.	8 15	6	
----- Port Augusta* -	8 30	9-12		Sutton Pool, England -	5 32	15½	11½
----- Point Riley -	5 45	4½		Sviatoi Nos, Lapland -	9 15	14	
----- Wallaroo - -	irr.	4-5		Svineoe Fiord, Færoe Ids.	12 0	6½	4½
				Swain Reefs, Australia E. Coast.	10 25	10	

* At Port Augusta, when the winds veers round to West and South, and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Swan Id., Bass Strait -	9 35	6		Tappahannock, U. States	0 42	2	1½
— Point, Australia,	0 10	26		Tappanooly Harbour, Su-	6 10	6	
W. Coast.				matra.			
Swan River, Gage Road	8 50	2¾		Taranaki or New Ply-	9 30	12	9
— Port Grey,	9 0	1-1½		mouth, New Zealand.			
Australia, W. Coast.				Tarbert, Ireland - -	4 57	14½	10½
Stancea. (Mumbles	6 1	27½	20½	Tarifa, Spain - -	1 46	6	3½
Lighthouse), Wales.				Tarn Pt., Solway, Scot-	11 22	23	18
Swatow, China, E. Coast	3 0	9		land.			
Swift Bay, Australia, N.	12 0	18		Tarpaulin Cove, United	8 4	2¾	2½
Coast.				States.			
Swina, E. side, Pentland	10 24	10	7½	Tarrytown, United States	9 57	4	3½
Firth.				Tatamagouche, Nova	10 0	8	5
— W. side, Pentland	9 35	10	7	Scotia.			
Firth.				Tatiyama Bay, Japan Sea	5 50	5	
Sydney, Australia, E. Cst.	8 38	4¾	4	Tauranga Harbour, New	7 10	6	4½
Sydney Harb., Cape Breton	9 0	5	4	Zealand.			
Tsing ho Yellow Sea -	4 10	10½	8	Tavoy R., (entrance) Bay	10 30	20	
Tybe Bay, Africa, W. Cst.	2 40	5		of Bengal, E. Coast.			
Tybe R., Africa, W. Cst.	4 45	3-4		Tay River (Bar), Scot-	2 6	16	14
Tybe Island, S. Pacific		3		land.			
Tybeo, San, River, Pata-	11 45	6		Tay-bay-oo-bay, China	10 15	6	
gonia, W. Coast.				Sea, E. Coast.			
Tybe, S. Pacific -	noon.	1½		Tebonkos Road, Baly. (N.	5 0	6½	
Tybe, Persian Gulf -	5 0?			Coast.)			
Tybeo ho, Yellow Sea -	0 15	6		Teelin Harb., Ireland -	5 16	11½	8½
Tybehow Ids., China, E. C.	9 0	14		Tees R. (Bar), England	3 45	15	
Tybe-Tai Bay, China Sea,	9 30	5¾		Teignmouth, England -	6 0	13	9½
E. Coast.				Tenby, Wales - -	6 0	27	20
Tybehuano, Chile -	10 14	5		Tenerife, Cape Verd Ids.,		8½	6
Tybean Island, Patagonia,	1 3	15½		(Santa Cruz).			
W. Coast.				Terceira, Azores -	12 32	4½	
Tybeung Channel, Canton	1 30	6½		Teriberka R., Lapland -	7 20	12	
River, China.				Terschelling (West),	8 40	6	5
Tybea-whan Bay, Yel-	10 47	10¾	8	Netherlands.			
low Sea.				Tetrina, White Sea -	3 17	7	
Tybea no Ura Harbour,		6-8	4-6	Tetuan, Africa, N. Coast	2 23	2½	1½
Tybe to Id., Japan Sea.				Texel (outside Shoals),	6 30	4	3½
Tybe-Sui Harbour, China	11 45	7-12		Netherlands.			
Sea, E. Coast.				Thirsty Sound, Australia,	10 45	12-18	
Tybe R., George Town,	12 5	10	7½	E. Coast.			
Tasmania.				Thomas St., Id., Africa -	3 25	4½	
Tybe R., Launceston,	1 0	12½		Thompson Sd., New Zea-	11 30	8	6
Tasmania.				land.			
— Port, Magellan	3 5	5		Thorny Passage, Spencer	12 0	6-8	
Strait.				Gulf, Australia, S. C.			
Tybeatave, Madagascar,	4 18	8		Thorsminde, Jutland -	3 34	2	
E. Coast.				Three Hummock Island	10 30	10	
Tybea Bay, United States	11 21	1¾	1½	(E. side), Bass Strait.			
Tybe, Ki Channel,	6 0	6	5½	Three Kings Islands, New	8 0	7	
Japan Sea.				Zealand.			
Tybea, Summer Islands,	6 37	14	10½	Three Points Cape, Africa,	4 0	4	
Scotland.				W. Coast.			
Tybeier, Africa, N. Coast	1 42	8		Three Rivers, River St.	11 30	1	
Tybeatang Harbour, Mada-	4 30	6		Lawrence.			
agascar, E. Coast.				Throgs Point, U. S. -	11 20	9½	7½
Tybejong Api, China Sea		7		Thurso, Scotland - -	8 28	14½	11
Tybejong Bolus, Malacca	9 30	10½	8½	Ticao Island, (Port San	6 30	6	
Strait.				Jacinto) Filipinas.			
Tybea, New Hebrides -	5 35	3		Tictoc Bay, Patagonia -	1 45	11	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tien-pak Harb., China, East Coast.	12 0	8½		Tromsø, Norway - -	1 45	8	
Timballier Bay, G. of Mexico.	irr.	2		Troon, Scotland -	11 50	10	7½
Tinghae, Chusan, China, E. Coast.	11 0	12	9	Troubridge Shoals, Aus- tralia S. Coast.	3 30	6	
Tobago, Caribbean Sea -	irr.	3½		Truro, England (Town Quay).	5 5	10	6
Tobermory, Isle of Mull	5 36	13	9½	Tsang-chow Id., Bias Bay, China, E. Coast.	8 30		
Toboe Ali Point, Banka {	8 30PM*	12		Tsau-liang-hai or Chosan Harb., Japan Sea.	7 45	7	5
Strait.	10 0AM†			Tsu-sima Sound, Japan Sea.	8 30	8	6
Tomo (Seto-uchi), Japan Sea.	11 0?		5	Tsugar Strait, Japan Sea	5 0	5	
Tongatabu, S. Pacific -	6 50	4		Tudwall, St., Road, Wales	7 45	14	
Tongsang Harb., China, E. Coast.	11 30	12		Tumaco Road, Ecuador -	2 33	12	
Tonning, Germany -	2 1	9		Tunis, Mediterranean -		3	
Tooniang Id., Bias Bay, China, E. Coast.	8 0			Turks Islands, Bahamas		3	
Topaze Harbour, British Columbia.	3 0	16	11½	Turna Bay, White Sea -	9 54	11	
Torbay, England - -	6 0	13½	10	Turner C., Prince Edwd. Island.	6 10	4	2
Toro Point, Chile - -	9 45			Turon B., Cochin China	3 0	4	
Tortola, Virgin Islands -	8 30	1½		Turtle Island (North), Australia, W. Coast.	11 0	18	
Tortugas, Florida, U. S.	9 56	1½	1	Tuticorin Harb., G. of Manar, Bay of Bengal, W. Coast.	1 15	2½	1½
Towan Id., China, E. C.	9 20	13		Tutukaka Harbour, New Zealand.	7 0	9	7
Tower Id., Galapagos -	?	?		Tweed River (Danger Point), Australia E.C.	9 45	5-8	
Townshend Harb., Tierra del Fuego.	2 30	5		Twofold B., Australia, E.C.	10 0	7	5
Townshend Port, Oregon	3 49	5½	5	Tylatiap Harb. Java, S.C.	8 45	3½	
Tracadie, Prince Edward Island.	7 0	3½	2	Tynemouth (Bar), England	3 20	14½	11½
Tracey Harbour, British Columbia.	12 0	16	11½	Typa Anchorage, China, E. Coast.	10 0	7	
Tracy Island, Korea, S. Coast.	8 53	11½	8½	Uist North (Kallin), Scot- land, W. Coast.	5 59	13½	9½
Træ Islands, Norway -	11 45	7		—— (Vallay), Scot- land, W. Coast.	6 10	11½	8½
Trawbreaga Lough, Ire- land.	6 10	11½	8½	—— South. (Loch Bois- dale), Scotland W. C.	5 47	12½	9½
Tréguier, France - -	5 32	25	18½	Ullapool, Loch Broom, Scotland.	6 40	14½	10½
Trek Island, White Sea -	10 48	20		Ummen Nakheilah, Per- sian Gulf.	7 30?	8?	
Trepassey, Newfoundland	7 0	6½	5	Underwood Port, New Zealand.	6 10	8	6
Tréport, France - -	11 9	27	21	Union Bay, La Plata -	3 10	12	9
Tres Cruces Point, Pata- gonia, W. Coast.	1 15	16		Union, Port la, G. of Fonseca, Cent. America.	3 15	10½	8½
Triangles, Gulf of Mexico		1½		Unsang, Borneo -	8 0	3½	
Trincomalie Har., Ceylon, S. Coast.	8 18	2	1½	Upervik, Greenland -	11 0	8	
Tringano R., G. of Siam, China Sea, W. Coast.	8 0	7		Upstart Bay, Australia, E. Coast.	9 0	6	
Trinidad (Port Spain), Caribbee Islands.	4 30	4	3	Urakami, Japan Sea -	7 30	6	5
Trinity Bay (Bull Id.) Newfoundland.	7 22	3½	2	Uranouchi, Japan Sea -			5
—— Harbour, New- foundland.	7 10	3½	2	Urie Firth, Shetlands -	9 45	6½	5
—— Opening, Great Barrier Reefs.	9 15	7-12		Ursula Id., Palawan, China Sea, E. Coast.	11 0	7½	
Tristan d'Acunha, South Atlantic.		8		Usborne Port, Australia, W. Coast.	1 45	34	
Triton Harb., New- foundland.	7 0?	2-4?					

* In S.E. monsoon.

† In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Ushant, France - -	3 32	19½	13½	Vivero, Spain, N. Coast	3 0	15	
Ushruffi Islands, Red Sea	6 14	2		Vladimir, St., Bay, G. of Tartary.	irr.	2	
Utria, New Granada -	4 0	12		Volcano Ids., China, E. Coast.	11 30	15	7½
Værø, Norway - -	12 0	9	7½	Voronov C., White Sea -	11 20	17	
Valdivia Port, Chile -	10 35	5		Waagoe Fiord, Færoe	6 0	9½	7½
Valentia Harb., Ireland -	3 42	11	8	Ids.			
Valentine Harb., Magellan Strait.	2 0			Waddington Harb., Bute Inlet, B. Columbia.	6 0	13	
Valery St.en-Caux, France	10 46	27	21½	Wahaay Harb. (Ceram), N. Coast, Moluccas.	6 0	3	
----- sur-Somme,	11 46	27	21½	Waikato R., New Zea- land.	9 30	12	9
France.				Wairoa River, New Zea- land.	6 45	7	4
Vallay, North Uist, Scot- land, W. Coast.	6 10	11½	8½	Walker Creek, Choiseul Id., Falkland Ids.	6 20	5½	
Vallenar R., Patagonia, W. Coast.	0 18	5		-----, R. Tyne, Eng- land.		10½	
Valparaiso, Chile -	9 32	5		Wallace Har., Nova Scotia	10 30	8	5
Vanderlin Island, Aus- tralia, N. Coast.	9 30	7	4	Wallis Id., Torres Strait	irr.	7	
Vansittart Bay, Australia, N.W. Coast.	9 15	6		Walvisch Bay, Africa, W. Coast.	1 54	6	
Vansittarts Saddle, Yel- low Sea.	4 20	10	8½	Wanchu R. (entrance), China, E. Coast.	9 0	15½	
Vao Port, Isle of Pines, New Caledonia.	8 6	4		----- (City), China, E. Coast.	9 30	15½	
Veere, Netherlands -	1 20	15		Wang-kia Bay, Yellow S.	2 30	9	7
Ventry, Ireland -	3 44	10½	7½	Wang-kia-tia Bay, Yel- low Sea.	6 0	12	9
Venus Harbour, Austra- lia, S. Coast.	2 15	6		Wanganui R., New Zea- land.	10 15	8	6
Vera Cruz, G. of Mexico		2		----- Inlet, New Zea- land.	11 20	7	6
Vermilion Bay, G. of Mexico.	irr.	2½	1½	Wangari Harbour, New Zealand.	7 0	9	7
Vernon Chan. (Chusan Arch), China, E. Coast	9 40	14		Wangaroa Harbour, New Zealand.	8 15	7	
Versavah, Hindoostan, W. Coast.	12 15	16		Wangaruru Harbour, New Zealand.	7 10	9	7
Verte Bay, Nova Scotia	10 0	9	5	Wapitapun Harb., G. of St. Lawrence.	10 30	5	3
Victoria Port, Brazil -	3 0	4		Warleigh Quay, River Tavy, England.	5 47	14½	10½
----- St. Juan de Fuca Strait.	irr.	7-10	5-8	Warnboro' Sd., Australia, W. Coast.		3-4	
Victoria River, Holdfast Reach, Australia, N.W. Coast.	9 0	16	10	Warrenpoint, Carling- ford, Ireland.	11 10	14½	12
----- Mosquito Flat, Australia, N.W. Coast.	12 19	15-24		----- Lough Foyle, Ireland.	6 20	6½	5
----- Sandy Id., Australia, N.W. Coast.	1 17	3-10		Warsheek Roads, Africa, E. Coast.	4 30	8	
----- Turtle Pt., Australia, N.W. Coast.	7 15	7-13		Watch Hill, United States	9 0	3	2½
Vigo, Spain - - -	3 0	12-13		Waterford (Bridge), Ire- land.	6 6	13½	10½
Vila Harb., Sandwich Id., Banks Ids.	5 0	5		Waterford (Duncannon Fort).	5 20	12½	10
Vin Harbour, G. St. Law- rence.	5 45	5	3	Waterloo Bay, Africa, S. Coast.	4 0	6	
Vincent, St., Cape, Mada- gascar, W. Coast.	4 45	12					
----- Caribbean Sea	3 0	1½	1				
----- Port St., New Caledonia.	5 50	4½					
Virgin C., Magellan Strait.	8 30	36-42					

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TIDE TABLES

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FOR THE YEAR

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ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.

COMPUTED BY JOHN BURDWOOD, STAFF COMMANDER, R.N.

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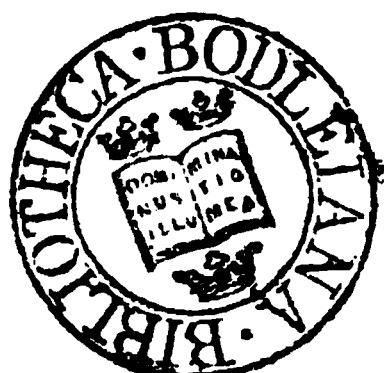
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BELFAST - Page	8	16	24	32	40	48	56	64	72	80	88	96
BREST - - - "	2	10	18	26	34	42	50	58	66	74	82	90
DEVONPORT - - "	2	10	18	26	34	42	50	58	66	74	82	90
DOVER - - - "	8	11	19	27	35	43	51	59	67	75	83	91
GALWAY - - - "	9	17	25	33	41	49	57	65	73	81	89	97
GREENOCK - - "	6	14	22	30	38	46	54	62	70	78	86	94
HARWICH - - "	4	12	20	28	36	44	52	60	68	76	84	92
HOLYHEAD - - "	7	15	23	31	39	47	55	63	71	79	87	95
HULL - - - - "	4	12	20	28	36	44	52	60	68	76	84	92
KINGSTOWN - - "	7	15	23	31	39	47	55	63	71	79	87	95
LEITH - - - - "	5	13	21	29	37	45	53	61	69	77	85	93
LIVERPOOL - - "	6	14	22	30	38	46	54	62	70	78	86	94
LONDON - - - - "	3	11	19	27	35	43	51	59	67	75	83	91
LONDONDERRY - "	8	16	24	32	40	48	56	64	72	80	88	96
PEMBROKE - - "	6	14	22	30	38	46	54	62	70	78	86	94
PORTSMOUTH - "	2	10	18	26	34	42	50	58	66	74	82	90
QUEENSTOWN - "	9	17	25	33	41	49	57	65	73	81	89	97
SHEKNESS - - "	3	11	19	27	35	43	51	59	67	75	83	91
SHIELDS (NORTH) "	5	13	21	29	37	45	53	61	69	77	85	93
SLIGO BAY - - "	8	16	24	32	40	48	56	64	72	80	88	96
SUNDERLAND - "	4	12	20	28	36	44	52	60	68	76	84	92
THURSO - - - - "	5	13	21	29	37	45	53	61	69	77	85	93
WATERFORD - - "	9	17	25	33	41	49	57	65	73	81	89	97
WESTON-SUPER-MARE	7	15	23	31	39	47	55	63	71	79	87	95

NOTICE.

If it be desired to reduce the Mean Time at any Place to that of Greenwich (or Railway) Time, (which latter is used in the Tide Tables, published in Liverpool and Glasgow,) the following correction must be applied to the Time given in these Tables :—

	Minutes.
Brest - - -	+ 18
Devonport - -	+ 17
Portsmouth - -	+ 4
Dover - - -	- 5
Sheerness - -	- 3
Harwich - - -	- 5
Hull - - -	+ 1
Sunderland - -	+ 5
North Shields -	+ 6
Leith - - -	+ 13
Thurso - - -	+ 14
Greenock - - -	+ 19
Liverpool - - -	+ 12
Pembroke - - -	+ 20
Weston-super-mare -	+ 12
Holyhead - - -	+ 18

For the Irish Ports, should Dublin Mean Time be required, the following correction must be applied to the time given in these Tables :—

	Minutes.
Kingstown - - -	- 1
Belfast - - -	- 2
Londonderry - -	+ 4
Sligo - - -	+ 9
Galway - - -	+ 11
Queenstown (Cork) -	+ 8
Waterford - - -	+ 3

The above corrections are also given at the foot of each page under the place for which the times and heights of high water are predicted.

JANUARY, 1867.

WIND.	MOON.	DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.	
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.		
			H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	D.		
1			7 25 14 9	7 58 15 0	9 15 13 4	9 49 13 6	10 41 15 10	11 14 15 11	25.3							
2			8 27 15 3	8 53 15 7	10 20 13 8	10 47 13 11	11 46 16 1	—	26.3							
3			9 16 15 10	9 39 16 11	11 12 14 1	11 33 14 3	0 15 16 3	0 39 16 6	27.3							
4			9 59 16 6	10 19 16 9	11 54 14 6	—	1 16 9	1 22 17 0	28.3							
5			10 40 17 0	11 0 17 3	0 12 14 9	0 31 14 11	1 44 17 1	2 2 17 6	29.3							
6			11 21 17 5	11 41 17 7	0 50 15 1	1 9 15 3	2 21 17 9	2 38 18 0	●							
7			12 0 17 8	—	1 26 15 4	1 44 15 5	2 57 18 2	3 12 18 4	1.5							
8			0 19 17 10	0 38 17 11	2 1 15 5	2 17 15 6	3 29 18 5	3 46 18 6	2.5							
9			0 57 17 11	1 17 17 11	2 35 15 6	2 51 15 5	4 2 18 7	4 20 18 7	3.5							
10			1 35 17 10	1 55 17 10	3 8 15 5	3 25 15 4	4 38 18 7	4 55 18 6	4.5							
11			2 15 17 8	2 36 17 5	3 44 15 3	4 4 15 1	5 14 18 5	5 34 18 3	5.5							
12			3 57 17 3	3 18 16 11	4 24 14 11	4 45 14 9	5 53 18 1	6 14 17 11	6.5							
13			3 40 16 8	4 3 16 4	5 7 14 6	5 31 14 3	6 36 17 8	7 0 17 5	7							
14			4 28 16 0	4 56 15 7	5 58 14 1	6 27 13 11	7 25 17 2	7 55 17 0	8.5							
15			5 25 15 5	5 56 15 4	7 1 13 8	7 37 13 8	8 28 16 9	9 5 16 8	9.5							
16			6 31 15 6	7 9 15 10	8 17 13 9	8 56 13 11	9 43 16 7	10 22 16 8	10.5							
17			7 48 16 3	8 24 16 10	9 34 14 3	10 10 14 7	11 2 16 10	11 38 17 1	11.5							
18			8 55 17 4	9 26 17 10	10 44 14 11	11 14 15 4	—	0 12 17 5	12.5							
19			9 55 18 4	10 24 18 10	11 41 15 8	—	0 43 17 10	1 11 18 3	13.5							
20			10 52 19 2	11 20 19 5	0 8 16 0	0 35 16 4	1 40 18 9	2 5 19 2	○							
21			11 46 19 6	—	1 1 16 7	1 26 16 9	2 29 19 5	2 55 19 8	15.5							
22			0 11 19 8	0 35 19 8	1 49 16 10	2 11 16 9	3 18 19 10	3 42 19 11	16.5							
23			0 59 19 6	1 23 19 11	2 33 16 8	2 54 16 7	4 3 19 11	4 24 19 10	17.5							
24			1 45 19 1	2 5 18 9	3 15 16 5	3 35 16 2	4 45 19 8	5 5 19 5	18.5							
25			2 26 18 1	2 47 17 10	3 55 15 10	4 15 15 6	5 25 19 1	5 46 18 9	19.5							
					9 4 35 15 2	4 55 14 9	6 6 18 5	6 26 17 11	20.5							
					7 5 16 14 4	5 39 14 0	6 48 17 6	7 10 17 1	21							
					6 6 3 13 7	6 30 13 3	7 33 16 8	7 53 16 3	22.5							
					11 7 0 12 11	7 33 12 9	8 27 15 11	9 3 15 8	23.5							
					11 8 11 12 9	8 50 12 9	9 39 15 6	10 17 15 4	24.5							
					6 9 27 12 11	10 3 13 110	54 15 5	11 31 15 6	25.5							
															8 ^{ft.} 0 ^{in.}	9 ^{ft.} 7 ^{in.}

8^{ft.} 0^{in.}9^{ft.} 7^{in.}

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
7	19		17	10	19		25	12	33	
7	44		18	10	38		26	12	47	
8	8		19	10	57		27	12	59	
8	31		20	11	15		28	13	11	
8	54		21	11	32		29	13	22	
9	16		22	11	49		30	13	32	
9	38		23	12	4		31	13	41	
9	59		24	12	19					

or Mean Time at Place; if Greenwich or Railway Time be required,—for

SHEERNESS subtract 3 m.

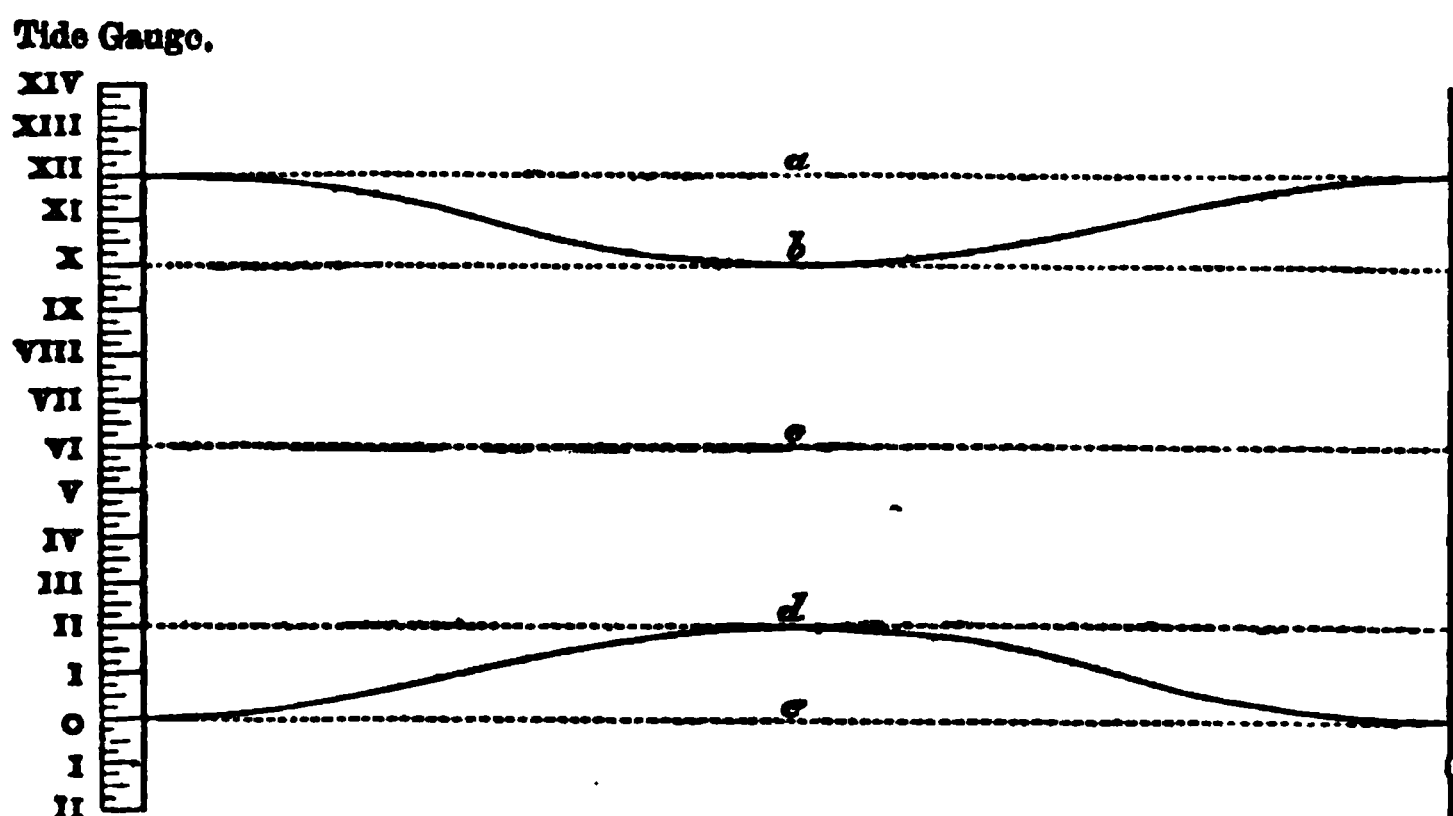
LONDON 0 m.

A 2

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge the latter being given in these tables, by applying to the times at the docks + 10^m and to the heights — 4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown, Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Mulaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Dun-cannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise, and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a* = Mean Level of High Water Ordinary Springs.
b = " " " Neaps.
c = Half Tide or Mean Level of the sea both at Springs and Neaps.
d = Mean Level of Low Water Ordinary Neaps.
e = " " " Springs.

Example.

	ft.
Spring Rise (or Mean Spring Range) = <i>e</i> to <i>a</i>	= 12
Neap Rise " " " = <i>e</i> to <i>b</i>	= 10
Neap Range " " " = <i>d</i> to <i>b</i>	= 8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1867.

TIDE TABLES FOR THE

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Tu.	1	8m31	0 12 14 0	0 43 14 3	1 37 12 5	2 13 12 7	7 59 10 3	8 33 10						
W.	2	9 17	1 11 14 7	1 37 15 0	2 43 12 9	3 12 13 0	9 2 10 7	9 29 10						
Th.	3	10 3	1 59 15 5	2 21 15 11	3 39 13 4	4 3 13 5	9 53 11 0	10 16 11						
F.	4	10 51	2 40 16 4	2 58 16 9	4 26 13 11	4 47 13 11	10 35 11 5	10 54 11						
S.	5	11 39	3 17 17 1	3 36 17 5	5 7 14 5	5 27 14 3	11 13 11 8	11 32 11						
S.	6	0a27	3 53 17 7	4 12 17 9	5 46 14 9	6 4 14 5	11 50 11 11	—						
M.	7	1 15	4 30 17 11	4 47 18 0	6 22 15 0	6 41 14 6	0 8 12 0	0 27 12						
Tu.	8	2 2	5 4 18 1	5 21 18 0	6 58 15 1	7 12 15 0	0 45 12 1	1 4 12 1						
W.	9	2 49	5 38 17 11	5 55 17 11	7 28 15 0	7 46 14 4	1 21 12 1	1 40 12 1						
Th.	10	3 36	6 14 17 9	6 34 17 6	8 4 14 9	8 22 14 0	1 57 12 1	2 15 12 4						
F.	11	4 23	6 54 17 2	7 14 16 11	8 40 14 4	8 58 13 7	2 35 11 11	2 55 11						
S.	12	5 11	7 36 16 5	8 1 16 0	9 17 13 11	9 39 13 4	3 15 11 8	3 36 11						
S.	13	6 1	8 26 15 7	8 52 15 3	10 4 13 5	10 30 13 0	3 59 11 4	4 22 11						
M.	14	6 53	9 23 15 0	9 57 14 11	10 58 13 1	11 30 12 9	4 48 10 11	5 18 10						
Tu.	15	7 48	10 35 14 11	11 15 15 1	—	0 8 12 11	5 50 10 8	6 26 10						
W.	16	8 46	11 56 15 5	—	0 48 13 0	1 28 13 3	7 4 10 8	7 43 10 1						
Th.	17	9 47	0 33 15 10	1 8 16 5	2 6 13 6	2 43 13 9	8 22 11 3	8 59 11						
F.	18	10 48	1 40 17 2	2 8 17 11	3 20 14 4	3 52 14 6	9 32 11 11	10 3 12						
S.	19	11 49	2 35 18 8	3 1 19 3	4 23 15 3	4 51 15 3	10 31 12 7	10 58 12 1						
S.	20	morn.	3 27 19 9	3 53 20 0	5 19 15 11	5 46 15 8	11 24 13 0	11 49 13						
M.	21	0 47	4 17 20 3	4 40 20 3	6 12 16 3	6 36 15 10	—	0 13 13						
Tu.	22	1 43	5 1 20 3	5 23 20 1	7 0 16 5	7 21 15 9	0 37 13 3	1 0 13						
W.	23	2 35	5 45 19 9	6 5 19 4	7 41 16 2	8 2 15 5	1 23 13 1	1 46 13						
Th.	24	3 24	6 25 18 11	6 45 18 4	8 21 15 7	8 40 14 9	2 6 12 10	2 26 12						
F.	25	4 11	7 5 17 8	7 25 16 11	8 57 14 9	9 13 14 0	2 46 12 4	3 6 12						
S.	26	4 57	7 46 16 2	8 7 15 6	9 30 13 11	9 49 13 2	3 25 11 8	3 45 11						
S.	27	5 42	8 29 14 9	8 53 14 1	10 9 12 11	10 30 12 6	4 5 11 1	4 27 10						
M.	28	6 27	9 21 13 7	9 52 13 3	10 54 12 2	11 20 11 10	4 51 10 4	5 16 10						
Tu.	29	7 12	10 29 13 1	11 9 13 0	11 53 11 8	—	5 45 9 10	6 21 9						
W.	30	7 58	11 48 13 1	—	0 29 11 9	1 6 11 8	6 58 9 7	7 36 9						
Th.	31	8 45	0 26 13 4	0 58 13 8	1 43 12 1	2 19 12 1	8 13 9 11	8 48 10						
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4 in.			

Phases of the Moon.

	D.	H.	M.	
New - - - - -	6	0	30	Morning.
First Quarter	13	4	34	Afternoon.
Full - - - - -	20	7	36	Morning.
Last Quarter	27	2	47	Afternoon.
<hr/>				
In Apogee - -	2	8	0	Afternoon.
In Perigee - -	18	2	0	Afternoon.
In Apogee - -	30	0	0	Noon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	14	8.10	9	9	8.55	17	17	N.53	25	3	S.
2	16	18	10	6	18	18	18	24	26	6	5
3	17	44	11	2	19	19	17	38	27	10	1
4	18	25	12	1	N.51	20	15	41	28	13	1
5	18	16	13	6	1	21	12	45	29	15	3
6	17	18	14	9	57	22	9	8	30	17	1
7	15	32	15	13	26	23	5	7	31	18	
8	13	2	16	16	9	24	0	59			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.			
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.
Tu.	1	7 25 14	9	7 58 15	0	9 15 13	4	9 49 13	6	10 41 15	10	11 14 15	112
W.	2	8 27 15	3	8 53 15	7	10 20 13	8	10 47 13	11	11 46 16	1	—	—
Th.	3	9 16 15	10	9 39 16	2	11 12 14	1	11 33 14	3	0 15 16	3	0 39 16	62
F.	4	9 59 16	6	10 19 16	9	11 54 14	6	—	—	1 16 9	1	1 22 17	02
S.	5	10 40 17	0	11 0 17	3	0 12 14	9	0 31 14	11	1 44 17	3	2 2 17	62
A.	6	11 21 17	5	11 4 17	7	0 50 15	1	1 9 15	3	2 21 17	9	2 38 18	0
M.	7	12 0 17	8	—	—	1 26 15	4	1 44 15	5	2 57 18	2	3 12 18	4
Tu.	8	0 19 17	10	—	—	2 1 15	5	2 17 15	6	3 29 18	5	3 46 18	6
W.	9	0 57 17	11	0 38 17	11	2 35 15	6	2 51 15	5	4 2 18	7	4 20 18	7
Th.	10	1 35 17	10	1 17 17	10	3 8 15	5	3 25 15	4	4 38 18	7	4 55 18	6
F.	11	2 15 17	8	1 55 17	5	3 44 15	3	4 4 15	1	5 14 18	5	5 34 18	3
S.	12	2 57 17	3	2 36 17	11	4 24 14	11	4 45 14	9	5 53 18	1	6 14 17	11
A.	13	3 40 16	8	3 18 16	4	5 7 14	6	5 31 14	3	6 36 17	8	7 0 17	5
M.	14	4 28 16	0	4 56 15	7	5 58 14	1	6 27 13	11	7 25 17	2	7 55 17	0
Tu.	15	5 25 15	5	5 56 15	4	7 1 13	8	7 37 13	8	8 28 16	9	9 5 16	8
W.	16	6 21 15	6	6 57 15	10	8 17 13	9	8 56 13	11	9 43 16	7	10 22 16	8
Th.	17	7 18 16	3	7 24 16	10	9 34 14	3	10 10 14	7	11 2 16	10	11 38 17	1
F.	18	8 15 17	4	8 26 17	10	10 44 14	11	11 14 15	4	—	—	0 12 17	5
S.	19	9 12 18	10	9 24 18	10	11 41 15	8	—	—	0 43 17	10	1 11 18	3
A.	20	10 9 19	2	10 20 19	5	0 8 16	0	0 35 16	4	1 40 18	9	2 5 19	2
M.	21	11 5 19	6	—	—	1 16 7	7	1 26 16	9	2 29 19	5	2 55 19	8
Tu.	22	12 0 19	8	0 35 19	8	1 49 16	10	2 11 16	9	3 18 19	10	3 42 19	11
W.	23	1 11 19	6	1 23 19	4	2 33 16	8	2 54 16	7	4 3 19	11	4 24 19	10
Th.	24	0 59 19	1	2 5 18	9	3 15 16	5	3 35 16	2	4 45 19	8	5 5 19	5
F.	25	1 45 19	4	2 47 17	10	3 55 15	10	4 15 15	6	5 25 19	1	5 46 18	9
S.	26	2 26 18	3	3 26 16	9	4 35 15	2	4 55 14	9	6 6 18	5	6 26 17	11
A.	27	3 7 17	2	4 7 15	7	5 16 14	4	5 39 14	0	6 48 17	6	7 10 17	1
M.	28	3 46 16	0	4 54 14	6	6 3 13	7	6 30 13	3	7 33 16	8	7 58 16	3
Tu.	29	4 30 15	1	5 52 13	11	7 0 12	11	7 33 12	9	8 27 15	11	9 3 15	8
W.	30	5 20 14	9	6 2 13	11	8 11 12	9	8 50 12	9	9 39 15	6	10 17 15	4
Th.	31	6 25 13	2	6 13 14	6	9 27 12	11	10 3 13	11	10 54 15	5	11 31 15	6

Half Mean Spring
Range.

9ft. 4in.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	3 44		9	7 19		17	10 19		25	12 33	
2	4 12		10	7 44		18	10 38		26	12 47	
3	4 40		11	8 8		19	10 57		27	12 59	
4	5 8		12	8 31		20	11 15		28	13 11	
5	5 35		13	8 54		21	11 32		29	13 22	
6	6 2		14	9 16		22	11 49		30	13 32	
7	6 28		15	9 38		23	12 4		31	13 41	
8	6 54		16	9 59		24	12 19				

The times a

re given for Mean Time at Place; if Greenwich or Railway Time be require
S. M. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Tu.	1	8m31	8 23 9 10	8 56 9 11	2 46 16 6	3 18 16 10	—	—	0 10 11 3					
W.	2	9 17	9 27 10 1	9 54 10 3	3 48 17 2	4 16 17 7	0 39 11 6	1 6 11 9						
Th.	3	10 3	10 21 10 4	10 44 10 6	4 41 17 11	5 2 18 2	1 31 12 0	1 54 12 2						
F.	4	10 51	11 5 10 8	11 24 10 9	5 22 18 6	5 41 18 9	2 17 12 5	2 36 12 8						
S.	5	11 39	11 43 10 11	—	—	6 0 19 0	6 19 19 2	2 55 12 10	3 14 13 0					
♄.	6	0a27	0 3 11 0	0 22 11 1	6 39 19 4	6 57 19 7	3 31 13 3	3 49 13 5						
M.	7	1 15	0 39 11 1	0 57 11 2	7 16 19 9	7 34 19 10	4 7 13 7	4 24 13 8						
Tu.	8	2 2	1 15 11 2	1 32 11 1	7 51 19 11	8 8 20 0	4 40 13 9	4 58 13 9						
W.	9	2 49	1 50 11 1	2 7 11 0	8 24 20 0	8 42 19 11	5 15 13 8	5 33 13 7						
Th.	10	3 36	2 25 11 0	2 43 10 11	9 0 19 9	9 20 19 7	5 51 13 5	6 11 13 3						
F.	11	4 23	3 2 10 10	3 22 10 9	9 40 19 4	10 0 19 1	6 31 13 1	6 53 12 11						
S.	12	5 11	3 41 10 8	4 1 10 7	10 20 18 10	10 42 18 6	7 15 12 9	7 38 12 7						
♄.	13	6 1	4 22 10 6	4 45 10 4	11 9 18 3	11 39 17 11	8 3 12 4	8 30 12 2						
M.	14	6 53	5 11 10 3	5 38 10 2	—	—	0 11 17 7	9 33 11 9						
Tu.	15	7 48	6 9 10 1	6 44 10 1	0 46 17 4	1 20 17 3	10 8 11 8	10 45 11 8						
W.	16	8 46	7 25 10 2	8 4 10 3	1 54 17 3	2 29 17 6	11 22 11 10	11 56 12 1						
Th.	17	9 47	8 41 10 5	9 17 10 8	3 3 18 0	3 38 18 7	—	0 30 12 6						
F.	18	10 48	9 51 10 11	10 24 11 2	4 13 19 2	4 43 19 9	1 3 12 11	1 33 13 4						
S.	19	11 49	10 52 11 5	11 20 11 8	5 10 20 3	5 37 20 9	2 4 13 9	2 32 14 1						
♄.	20	morn.	11 47 11 10	—	—	6 4 21 2	6 31 21 6	3 24 14 8						
M.	21	0 47	0 14 11 11	0 39 12 0	6 57 21 8	7 21 21 10	3 49 14 11	4 12 15 1						
Tu.	22	1 43	1 2 12 0	1 25 12 0	7 44 21 11	8 6 21 10	4 34 15 2	4 56 15 1						
W.	23	2 35	1 47 11 11	2 10 11 10	8 28 21 9	8 50 21 6	5 18 14 11	5 40 14 8						
Th.	24	3 24	2 32 11 8	2 53 11 6	9 10 21 1	9 30 20 7	6 1 14 4	6 22 14 0						
F.	25	4 11	3 13 11 3	3 33 11 1	9 51 20 1	10 11 19 6	6 43 13 8	7 5 13 3						
S.	26	4 57	3 53 10 11	4 12 10 8	10 31 18 10	10 53 18 4	7 27 12 10	7 49 12 5						
♄.	27	5 42	4 31 10 5	4 52 10 2	11 17 17 9	11 44 17 2	8 11 12 0	8 35 11 7						
M.	28	6 27	5 15 9 11	5 40 9 9	—	—	0 15 16 7	9 31 10 11						
Tu.	29	7 12	6 7 9 7	6 39 9 6	0 45 16 1	1 16 15 11	10 3 10 8	10 40 10 7						
W.	30	7 58	7 19 9 6	7 58 9 7	1 49 15 9	2 23 15 9	11 16 10 6	11 52 10 7						
Th.	31	8 45	8 35 9 7	9 10 9 8	2 58 15 11	3 32 16 3	—	0 24 10 10						
Half Mean Spring } Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.			

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
New - - - -	6	0	30	Morning.	1	14	8.10	9	9	8.55	17	17	N.53	25	3	8.4
First Quarter	13	4	34	Afternoon.	2	16	18	10	6	18	18	18	24	26	6	52
Full - - - -	20	7	36	Morning.	3	17	44	11	2	19	19	17	38	27	10	16
Last Quarter	27	2	47	Afternoon.	4	18	25	12	1	N.51	20	15	41	28	13	12
					5	18	16	13	6	1	21	12	45	29	15	52
In Apogee -	2	8	0	Afternoon.	6	17	18	14	9	57	22	9	8	30	17	15
In Perigee -	18	2	0	Afternoon.	7	15	32	15	13	26	23	5	7	31	18	9
In Apogee -	30	0	0	Noon.	8	13	2	16	16	9	24	0	59			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.	
Tu.	1	—	—	0 24	10 3	11 17	12 10	11 46	13 0	5 19	9 6	5 48	9 8	25.3
W.	2	0 52	10 5	1 18	10 7	—	—	0 12	13 3	6 14	9 11	6 36	10 3	26.3
Th.	3	1 41	10 9	2 11	11 0	0 35	13 6	0 56	13 9	6 55	10 7	7 13	10 11	27.3
F.	4	2 31	11 3	2 40	11 6	1 16	14 1	1 35	14 5	7 29	11 4	7 45	11 8	28.3
S.	5	2 57	11 9	3 14	11 11	1 53	14 8	2 12	14 11	8 11	11 11	8 18	12 2	29.3
A.	6	3 32	12 2	3 50	12 4	2 30	15 2	2 48	15 4	8 36	12 4	8 53	12 5	●
M.	7	4 8	12 5	4 25	12 6	3 5	15 5	3 21	15 6	9 10	12 5	9 27	12 6	1.5
Tu.	8	4 43	12 6	5 1	12 5	3 38	15 6	3 56	15 5	9 45	12 5	10 2	12 4	2.5
W.	9	5 19	12 5	5 37	12 4	4 12	15 4	4 31	15 4	10 21	12 3	10 40	12 2	3.5
Th.	10	5 55	12 3	6 15	12 2	4 50	15 3	5 9	15 2	11 0	12 0	11 21	11 10	4.5
		6 35	12 1	6 56	11 11	5 29	15 0	5 51	14 10	11 43	11 7	—	—	5.5
		7 17	11 9	7 40	11 6	6 14	14 7	6 37	14 3	0 5	11 5	0 28	11 2	6.5
		8 7	11 3	8 36	10 11	7 2	14 0	7 31	13 9	0 54	10 11	1 22	10 8	7
		9 7	10 9	9 43	10 7	8 2	13 7	8 37	13 4	1 52	10 6	2 28	10 4	8.5
		0 21	10 7	10 58	10 8	9 13	13 3	9 52	13 4	3 5	10 3	3 48	10 3	9.5
		1 34	10 10	—	—	10 28	13 5	11 3	13 9	4 27	10 4	5 4	10 6	10.5
		0 10	11 1	0 44	11 5	11 37	14 1	—	—	5 39	10 9	6 11	11 2	11.5
		1 15	11 9	1 42	12 1	0 9	14 6	0 36	15 0	6 37	11 9	7 2	12 4	12.5
		2 9	12 6	2 35	13 0	1 3	15 6	1 30	16 0	7 25	12 11	7 48	13 5	13.5
		3 0	13 4	3 25	13 7	1 57	16 5	2 23	16 9	8 11	13 9	8 35	14 0	○
		3 49	13 10	4 13	14 0	2 48	17 0	3 10	17 1	8 58	14 1	9 20	14 1	15.5
		4 35	14 0	4 58	13 10	3 31	17 1	3 53	16 11	9 42	13 11	10 5	13 9	16.5
		5 20	13 8	5 43	13 5	4 15	16 9	4 38	16 6	10 28	13 6	10 50	13 2	17.5
		6 5	13 2	6 25	12 11	4 59	16 3	5 19	15 11	11 11	12 9	11 33	12 4	18.5
		6 46	12 7	7 7	12 2	5 41	15 6	6 3	15 11	11 55	11 11	—	—	19.5
		7 29	11 9	7 51	11 4	6 25	14 7	6 47	14 2	0 17	11 5	0 39	11 0	20.5
		8 15	10 10	8 41	10 5	7 10	13 8	7 36	13 3	1 2	10 6	1 27	10 1	21.5
		9 11	10 0	9 42	9 9	8 5	12 9	8 35	12 5	1 55	9 9	2 26	9 4	22.5
		10 16	9 7	10 52	9 6	9 9	12 3	9 46	12 1	3 1	9 2	3 42	9 0	23.5
		11 28	9 7	—	—	10 22	12 1	10 58	12 2	4 21	8 11	4 58	8 11	24.5
		0 5	9 8	0 38	9 10	11 31	12 4	—	—	5 33	9 0	6 3	9 3	25.5
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Half Mean Spring Range. } 6ft. 8in.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	44	Sub.	9	7	19	Sub.	17	10	19	Sub.	25	12	33	Sub.
2	4	13		10	7	44		18	10	38		26	12	47	
3	4	40		11	8	8		19	10	57		27	12	59	
4	5	8		12	8	31		20	11	15		28	13	11	
5	5	35		13	8	54		21	11	32		29	13	22	
6	6	2		14	9	16		22	11	49		30	13	32	
7	6	28		15	9	38		23	12	4		31	13	41	
8	6	54		16	9	59		24	12	19					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 8 m. | LEITH add 13 m. | THURSO add 14 m.

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S 'TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Tu.	1	8 m 31	8 24	8 3	8 55	8 4	7 52	20 7	8 24	20 11	2 13	15 9	2 48	16
W.	2	9 17	9 24	8 6	9 51	8 7	8 50	21 4	9 14	21 9	3 19	16 5	3 47	16
Th.	3	10 3	10 14	8 8	10 36	8 9	9 35	22 2	9 56	22 8	4 12	17 4	4 36	17
F.	4	10 51	10 56	8 10	11 16	8 11	10 14	23 0	10 32	23 4	4 59	18 2	5 21	18
S.	5	11 39	11 37	9 0	11 57	9 1	10 51	23 7	11 10	23 11	5 42	18 10	6 2	19
S.	6	0 a 27	—	—	0 17	9 2	11 29	24 3	11 47	24 6	6 21	19 5	6 38	19
M.	7	1 15	0 36	9 3	0 54	9 4	—	—	0 5	24 8	6 57	19 10	7 13	19
Tu.	8	2 2	1 12	9 5	1 30	9 5	0 22	24 9	0 40	24 10	7 30	19 11	7 47	19
W.	9	2 49	1 47	9 5	2 5	9 6	0 57	24 10	1 15	24 9	8 5	19 10	8 23	19
Th.	10	3 36	2 22	9 6	2 41	9 5	1 33	24 7	1 51	24 4	8 42	19 8	9 2	19
F.	11	4 23	3 0	9 4	3 19	9 3	2 10	24 1	2 30	23 9	9 21	19 2	9 40	18
S.	12	5 11	3 38	9 3	3 59	9 2	2 49	23 6	3 10	23 1	9 59	18 6	10 21	18
S.	13	6 1	4 23	9 1	4 47	9 0	3 33	22 8	3 58	22 2	10 43	17 9	11 6	17
M.	14	6 53	5 12	8 10	5 43	8 9	4 27	21 9	5 1	21 5	11 32	16 11	—	—
Tu.	15	7 48	6 16	8 8	6 52	8 7	5 37	21 4	6 18	21 4	0 1	16 9	0 33	16
W.	16	8 46	7 30	8 7	8 8	8 9	6 59	21 7	7 37	22 2	1 13	16 9	1 57	17
Th.	17	9 47	8 45	8 11	9 21	9 1	8 14	22 9	8 47	23 5	2 37	17 7	3 16	18
F.	18	10 48	9 53	9 3	10 23	9 5	9 16	24 3	9 43	24 11	3 50	19 1	4 23	19
S.	19	11 49	10 52	9 7	11 21	9 8	10 9	25 8	10 35	26 2	4 55	20 6	5 25	21
S.	20	morn.	11 49	9 10	—	—	11 2	26 7	11 28	27 0	5 54	21 6	6 20	21
M.	21	0 47	0 16	9 11	0 41	10 0	11 52	27 3	—	—	6 43	22 2	7 6	22
Tu.	22	1 43	1 5	10 1	1 28	10 1	0 15	27 4	0 38	27 3	7 28	22 2	7 50	21
W.	23	2 35	1 49	10 1	2 11	10 0	1 0	27 2	1 22	26 9	8 12	21 8	8 33	21
Th.	24	3 24	2 31	9 11	2 51	9 9	1 42	26 3	2 1	25 7	8 53	20 9	9 13	20
F.	25	4 11	3 11	9 7	3 30	9 5	2 21	25 0	2 40	24 3	9 32	19 7	9 50	18
S.	26	4 57	3 48	9 3	4 8	9 1	2 59	23 6	3 19	22 9	10 8	18 3	10 27	17
S.	27	5 42	4 29	8 11	4 51	8 9	3 40	22 0	4 3	21 3	10 47	16 11	11 7	16
M.	28	6 27	5 15	8 6	5 41	8 4	4 30	20 6	4 59	19 10	11 29	15 6	11 56	15
Tu.	29	7 12	6 11	8 2	6 47	8 0	5 33	19 6	6 12	19 4	—	—	0 29	14
W.	30	7 58	7 24	7 11	8 1	8 0	6 53	19 4	7 31	19 6	1 5	14 9	1 47	14
Th.	31	8 45	8 38	8 1	9 10	8 2	8 6	19 10	8 39	20 4	2 27	15 1	3 3	15
Half Mean Spring } Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			

<i>Phases of the Moon.</i>				<i>Moon's Declination at Noon.</i>															
	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
New - - - - -	6	0	30	Morning.	1	14	S. 10		9	9	S. 55		17	17	N. 53		25	3	S.
First Quarter -	13	4	34	Afternoon.	2	16	18		10	6	18		18	18	24		26	6	S.
Full - - - - -	20	7	36	Morning.	3	17	44		11	2	19		19	17	38		27	10	1
Last Quarter -	27	2	47	Afternoon.	4	18	25		12	1	N. 51		20	15	41		28	13	1
					5	18	16		13	6	1		21	12	45		29	15	3
In Apogee - -	2	8	0	Afternoon.	6	17	18		14	9	57		22	9	8		30	17	1
In Perigee - -	18	2	0	Afternoon.	7	15	32		15	13	26		23	5	7		31	18	
In Apogee - -	30	0	0	Noon.	8	13	2		16	16	9		24	0	59				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK *add 19 m.* | **LIVERPOOL** *add 12 m.* | **PENBROKE** *add 20 m.*

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.
Tu.	1	2	46	28	11	3	21	29	3	6	51	12	10	7	20	13	0	7	38	9	1	8	8	9	2	25.3
W.	2	3	53	29	10	4	24	30	5	7	46	13	3	8	10	13	6	8	36	9	4	9	3	9	5	26.3
Th.	3	4	51	31	2	5	17	31	11	8	31	13	9	8	51	14	0	9	27	9	7	9	50	9	9	27.3
F.	4	5	40	32	7	6	1	33	2	9	9	14	3	9	27	14	5	10	9	9	11	10	26	10	0	28.3
S.	5	6	23	33	8	6	44	34	2	9	45	14	7	10	3	14	10	10	43	10	2	11	0	10	4	29.3
S.	6	7	3	34	6	7	22	35	0	10	21	15	0	10	38	15	1	11	18	10	5	11	36	10	6	●
M.	7	7	40	35	4	7	57	35	6	10	53	15	2	11	9	15	3	11	53	10	6	—	—	—	—	1.5
Tu.	8	8	15	35	7	8	31	35	8	11	26	15	3	11	43	15	3	0	10	10	6	0	28	10	6	2.5
W.	9	8	47	35	8	9	4	35	7	—	—	—	—	0	2	15	2	0	46	10	5	1	5	10	5	3.5
Th.	10	9	21	35	5	9	38	35	1	0	21	15	1	0	42	15	0	1	24	10	4	1	44	10	3	4.5
F.	11	9	56	34	8	10	13	34	3	1	3	14	10	1	25	14	7	2	4	10	1	2	25	10	0	5.5
S.	12	10	30	33	7	10	49	32	11	1	47	14	5	2	10	14	2	2	47	9	11	3	9	9	10	6.5
S.	13	11	10	32	3	11	33	31	7	2	35	14	0	3	3	13	9	3	34	9	8	4	1	9	7	7.5
M.	14	—	—	—	—	0	3	30	11	3	33	13	7	4	9	13	4	4	32	9	5	5	7	9	3	8.5
Tu.	15	0	36	30	7	1	11	30	6	4	40	13	4	5	25	13	5	5	41	9	3	6	15	9	3	9.5
W.	16	1	50	30	8	2	30	31	3	6	2	13	7	6	37	13	10	6	49	9	5	7	24	9	7	10.5
Th.	17	3	10	31	11	3	51	32	10	7	11	14	2	7	43	14	6	7	59	9	10	8	33	10	0	11.5
F.	18	4	28	34	0	5	4	35	2	8	12	15	0	8	39	15	5	9	6	10	3	9	37	10	6	12.5
S.	19	5	36	36	4	6	6	37	3	9	5	15	10	9	30	16	2	10	5	10	9	10	29	11	0	13.5
S.	20	6	35	38	0	7	2	38	6	9	56	16	5	10	21	16	8	10	53	11	2	11	17	11	4	○
M.	21	7	27	39	0	7	50	39	3	10	43	16	9	11	2	16	10	11	41	11	5	—	—	—	—	15.5
Tu.	22	8	12	39	2	8	33	38	11	11	23	16	9	11	45	16	7	0	4	11	5	0	26	11	4	16.5
W.	23	8	54	38	6	9	13	38	0	—	—	—	—	0	8	16	5	0	49	11	3	1	12	11	1	17.5
Th.	24	9	31	37	4	9	49	36	5	0	31	16	1	0	53	15	9	1	34	10	10	1	54	10	8	18.5
F.	25	10	6	35	5	10	22	34	3	1	15	15	4	1	37	14	11	2	15	10	5	2	37	10	2	19.5
S.	26	10	38	33	2	10	55	32	0	1	58	14	6	2	20	14	0	2	58	9	11	3	19	9	9	20.5
S.	27	11	14	30	10	11	36	29	8	2	43	13	7	3	8	13	2	3	42	9	6	4	7	9	3	21.5
M.	28	—	—	—	—	0	1	28	8	3	37	12	9	4	7	12	5	4	35	9	0	5	5	8	9	22.5
Tu.	29	0	31	28	0	1	6	27	7	4	42	12	3	5	19	12	2	5	35	8	8	6	9	8	7	23.5
W.	30	1	44	27	5	2	22	27	5	5	56	12	2	6	32	12	3	6	43	8	8	7	19	8	9	24.5
Th.	31	3	0	27	10	3	36	28	5	7	5	12	5	7	35	12	9	7	52	8	10	8	23	9	0	25.5
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	44	Sub.	9	7	19	Sub.	17	10	19	Sub.	25	12	33	Sub.
2	4	12		10	7	44		18	10	38		26	12	47	
3	4	40		11	8	8		19	10	57		27	12	59	
4	5	8		12	8	31		20	11	15		28	13	11	
5	5	35		13	8	54		21	11	32		29	13	22	
6	6	2		14	9	16		22	11	49		30	13	32	
7	6	28		15	9	38		23	12	4		31	13	41	
8	6	54		16	9	59		24	12	19					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H. M.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.	H. M.	F. I.	F. I.
Tu.	1	8m31	7 24	8 0			7 54	8 1			4 48	6 1			5 13	6 3			1 57	8 6			2 27	8 8		
W.	2	9 17	8 20	8 3			8 44	8 5			5 34	6 4			5 55	6 5			2 52	8 10			3 15	9 2		
Th.	3	10 3	9 5	8 6			9 26	8 8			6 16	6 6			6 36	6 8			3 35	9 3			3 53	9 9		
F.	4	10 51	9 44	8 10			10 2	8 11			6 55	6 9			7 15	6 10			4 11	9 9			4 29	10 6		
S.	5	11 37	10 21	9 0			10 39	9 1			7 35	6 11			7 54	7 1			4 48	10 2			5 7	10 4		
S.	6	0a27	10 57	9 1			11 15	9 2			8 11	7 2			8 28	7 3			5 26	10 6			5 44	10 10		
M.	7	1 15	11 31	9 2			11 47	9 2			8 44	7 3			8 59	7 3			6 1	10 8			6 17	10 10		
Tu.	8	2 2	—	—			0 4	9 2			9 15	7 3			9 31	7 2			6 34	10 7			6 52	10 10		
W.	9	2 49	0 22	9 2			0 41	9 2			9 48	7 1			10 5	7 0			7 10	10 5			7 28	10 10		
Th.	10	3 26	1 0	9 2			1 20	9 1			10 23	6 11			10 43	6 10			7 47	10 1			8 6	9 10		
F.	11	4 23	1 42	9 1			2 5	9 0			11 4	6 9			11 28	6 7			8 26	9 9			8 48	9 10		
S.	12	5 11	2 28	8 11			2 52	8 9			11 55	6 5			—	—			9 12	9 5			9 40	9 10		
S.	13	6 1	3 18	8 8			3 45	8 7			0 27	6 2			1 1	6 1			10 10	9 1			10 42	8 10		
M.	14	6 53	4 14	8 6			4 47	8 5			1 37	6 0			2 20	5 11			11 18	8 10			11 54	8 10		
Tu.	15	7 48	5 21	8 4			5 55	8 4			2 58	6 1			3 33	6 3			—	—			0 30	8 11		
W.	16	8 46	6 32	8 4			7 9	8 5			4 6	6 5			4 37	6 8			1 6	9 0			1 42	9 3		
Th.	17	9 47	7 45	8 6			8 17	8 8			5 5	6 10			5 31	7 0			2 17	9 6			2 49	9 9		
F.	18	10 48	8 45	8 11			9 13	9 2			5 57	7 3			6 23	7 5			3 16	10 2			3 42	10 6		
S.	19	11 49	9 40	9 5			10 6	9 7			6 51	7 8			7 19	7 10			4 7	10 11			4 33	11 3		
S.	20	morn.	10 32	9 8			10 57	9 9			7 46	7 11			8 11	8 1			4 59	11 6			5 25	11 9		
M.	21	0 47	11 20	9 9			11 40	9 9			8 33	8 2			8 53	8 2			5 49	11 10			6 10	11 10		
Tu.	22	1 43	—	—			0 1	9 8			9 13	8 1			9 34	7 11			6 32	11 9			6 54	11 7		
W.	23	2 35	0 24	9 8			0 47	9 7			9 54	7 9			10 14	7 7			7 17	11 4			7 38	11 0		
Th.	24	3 24	1 10	9 6			1 31	9 5			10 34	7 4			10 54	7 2			7 57	10 8			8 17	10 4		
F.	25	4 11	1 54	9 3			2 17	9 1			11 15	6 11			11 40	6 7			8 38	10 0			8 59	9 7		
S.	26	4 57	2 40	8 11			3 2	8 9			—	—			0 7	6 3			9 22	9 3			9 48	9 0		
S.	27	5 42	3 25	8 6			3 50	8 4			0 36	6 0			1 8	5 9			10 15	8 8			10 45	8 5		
M.	28	6 27	4 17	8 2			4 46	8 1			1 42	5 7			2 17	5 5			11 16	8 2			11 49	8 1		
Tu.	29	7 12	5 16	8 0			5 51	7 10			2 53	5 5			3 28	5 6			—	—			0 24	8 0		
W.	30	7 58	6 27	7 10			7 3	7 11			4 2	5 8			4 35	5 9			1 0	8 0			1 37	8 1		
Th.	31	8 45	7 38	7 11			8 9	8 0			5 2	5 11			5 28	6 0			2 11	8 2			2 42	8 1		
Half Mean Spring } Range.			4ft. 9in.								3ft. 10in.								5ft. 7in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
New - - - - - 6 0 30 Morning.												1 14 S. 10 9 9 S. 55 17 17 N. 53 25 3 S. 4														
First Quarter - 13 4 34 Afternoon.												2 16 18 10 6 18 18 18 24 26 6 52														
Full - - - - - 20 7 36 Morning.												3 17 44 11 2 19 19 17 38 27 10 16														
Last Quarter - 27 2 47 Afternoon.												4 18 25 12 1 N. 51 20 15 41 28 13 12														
In Apogee - - 2 8 0 Afternoon.												5 18 16 13 6 1 21 12 45 29 15 32														
In Perigee - - 18 2 0 Afternoon.												6 17 18 14 9 57 22 9 8 30 17 13														
In Apogee - - 30 0 0 Noon.												7 15 32 15 13 26 23 5 7 31 18 9														
												8 13 2 16 16 9 24 0 59														

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

JANUARY, 1867.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	
1	1	9 11 1		1 38 11 4		1 10 9 3		1 45 9 4		1 20 9 11		1 53 10 1	25.3	
2	2	3 11 7		2 27 11 10		2 15 9 6		2 43 9 8		2 24 10 3		2 54 10 6	26.3	
3	3	50 12 1		3 12 12 4		3 7 9 10		3 30 10 1		3 21 10 8		3 46 10 10	27.3	
4	4	31 12 7		3 49 12 10		3 50 10 4		4 10 10 6		4 9 11 1		4 31 11 3	28.3	
5	5	4 8 13 1		4 27 13 4		4 30 10 8		4 50 10 10		4 53 11 4		5 13 11 6	29.3	
6	6	4 44 13 7		5 2 13 10		5 9 11 0		5 28 11 1		5 32 11 7		5 50 11 8	30.3	
7	7	5 20 13 11		5 37 14 0		5 47 11 2		6 3 11 3		6 7 11 10		6 24 11 11	1.5	
8	8	5 56 14 0		6 13 14 0		6 22 11 3		6 39 11 3		6 42 11 11		7 0 11 11	2.5	
9	9	6 31 13 11		6 50 13 10		6 57 11 3		7 15 11 2		7 18 12 0		7 36 12 0	3.5	
10	10	7 9 13 9		7 29 13 7		7 33 11 1		7 52 10 11		7 54 11 11		8 12 11 10	4.5	
11	11	7 50 13 4		8 12 13 2		8 12 10 10		8 31 10 8		8 30 11 9		8 49 11 8	5.5	
12	12	8 34 12 9		8 59 12 5		8 50 10 6		9 11 10 3		9 7 11 6		9 26 11 4	6.5	
13	13	9 25 12 1		9 53 11 10		9 34 10 1		9 58 9 11		9 49 11 1		10 16 10 11	7.5	
14	14	10 27 11 8		11 2 11 8		10 27 9 9		11 1 9 8		10 49 10 8		11 22 10 6	8.5	
15	15	11 40 11 9		— — — —		11 37 9 8		— — — —		11 56 10 5		— — — —	9.5	
16	16	0 18 11 11		0 54 12 2		0 16 9 9		0 55 9 11		0 30 10 5		1 5 10 8	10.5	
17	17	1 29 12 6		1 0 13 0		1 34 10 2		2 12 10 5		1 42 10 10		2 22 11 2	11.5	
18	18	2 30 13 5		2 59 13 11		2 45 10 9		3 17 11 1		2 58 11 7		3 33 11 10	12.5	
19	19	3 27 14 4		3 53 14 9		3 46 11 6		4 14 11 9		4 5 12 3		4 35 12 6	13.5	
20	20	4 19 15 1		4 44 15 5		4 42 12 0		5 8 12 2		5 5 12 8		5 31 12 10	14.5	
21	21	5 7 15 8		5 30 15 9		5 33 12 4		5 57 12 4		5 54 12 11		6 17 13 0	15.5	
22	22	5 53 15 8		6 15 15 6		6 20 12 4		6 42 12 3		6 40 13 0		7 3 12 10	16.5	
23	23	6 37 15 3		6 59 14 11		7 4 12 1		7 24 11 10		7 25 12 10		7 45 12 8	17.5	
24	24	7 19 14 7		7 40 14 2		7 44 11 7		8 4 11 4		8 4 12 6		8 23 12 3	18.5	
25	25	8 2 13 8		8 23 13 2		8 23 11 0		8 40 10 8		8 41 12 0		8 58 11 8	19.5	
26	26	8 45 12 7		9 7 12 0		8 58 10 4		9 18 10 0		9 15 11 4		9 33 11 0	20.5	
27	27	9 29 11 6		9 56 11 0		9 39 9 8		10 1 9 4		9 53 10 8		10 19 10 4	21.5	
28	28	10 25 10 8		10 57 10 6		10 25 9 1		10 56 8 11		10 48 9 11		11 18 9 9	22.5	
29	29	11 34 10 4		— — — —		11 32 8 9		— — — —		11 51 9 6		— — — —	23.5	
30	30	0 12 10 4		0 49 10 5		0 10 8 8		0 47 8 9		0 24 9 5		1 0 9 6	24.5	
31	31	1 23 10 7		1 53 10 11		1 24 8 11		2 0 9 1		1 34 9 7		2 8 9 9	25.5	
Half Mean Spring		7ft. 5in.				5ft 10in.				6ft. 2in.				

Half Mean Spring } 7ft. 5in.
Range.

5ft 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	3 44		9	7 19		17	10 19		25	12 33	
2	4 12		10	7 44		18	10 38		26	12 47	
3	4 40		11	8 8		19	10 57		27	12 59	
4	5 8		12	8 31		20	11 15		28	13 11	
5	5 35		13	8 54		21	11 32		29	13 22	
6	6 2		14	9 16		22	11 49		30	13 32	
7	6 28		15	9 38		23	12 4		31	13 41	
8	6 54		16	9 59		24	12 19				

The times of High Water are given for Mean 'Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

FEBRUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
F.	1	9m33	1	28	14	2	1	56	14	9	2	53	12	8	3	24	12	8	9	19	10	5	9	48	10	
S.	2	10 21	2	18	15	5	2	39	16	0	3	53	13	5	4	18	13	4	10	12	11	0	10	34	11	
S.	3	11 10	2	58	16	8	3	16	17	2	4	41	14	2	5	4	13	11	10	53	11	6	11	12	11	
M.	4	11 58	3	35	17	9	3	52	18	1	5	24	14	9	5	44	14	5	11	31	11	11	11	48	12	
Tu.	5	0a46	4	9	18	5	4	27	18	8	6	3	15	2	6	22	14	9	—	—	—	—	0	5	12	
W.	6	1 34	4	45	18	10	5	1	19	0	6	39	15	7	6	59	15	0	0	23	12	5	0	42	12	
Th.	7	2 22	5	18	19	1	5	36	19	1	7	15	15	7	7	31	15	0	1	0	12	7	1	18	12	
F.	8	3 10	5	54	19	0	6	13	18	10	7	49	15	5	8	7	14	10	1	37	12	7	1	56	12	
S.	9	3 59	6	32	18	7	6	52	18	2	8	27	15	0	8	46	14	6	2	14	12	6	2	33	12	
S.	10	4 50	7	12	17	8	7	36	17	1	9	4	14	7	9	22	14	2	2	53	12	3	3	14	12	
M.	11	5 43	8	0	16	5	8	26	15	9	9	45	14	0	10	10	13	7	3	36	11	10	3	58	11	
Tu.	12	6 38	8	55	15	3	9	27	14	10	10	37	13	4	11	6	13	1	4	23	11	3	4	51	10	
W.	13	7 35	10	5	14	7	10	49	14	7	11	40	12	11	—	—	—	—	5	23	10	8	5	58	10	
Th.	14	8 34	11	33	14	9	—	—	—	—	0	18	12	11	1	0	12	10	6	39	10	5	7	22	10	
F.	15	9 33	0	17	15	1	0	56	15	8	1	42	13	3	2	24	13	3	8	4	10	9	8	46	11	
S.	16	10 31	1	32	16	5	2	1	17	2	3	2	14	1	3	39	14	1	9	23	11	6	9	55	11	
S.	17	11 27	2	28	17	11	2	53	18	9	4	11	14	11	4	39	14	9	10	24	12	3	10	49	12	
M.	18	morn.	3	17	19	9	3	39	19	9	5	6	15	8	5	33	15	4	11	13	12	9	11	35	13	
Tu.	19	0 21	4	0	20	0	4	22	20	2	5	56	16	1	6	18	15	8	11	56	13	1	—	—	—	
W.	20	1 12	4	44	20	2	5	2	20	1	6	40	16	4	7	2	15	9	0	18	13	2	0	40	13	
Th.	21	2 1	5	20	19	11	5	39	19	8	7	20	16	1	7	37	15	5	1	1	13	1	1	21	13	
F.	22	2 48	5	57	19	3	6	16	18	9	7	54	15	7	8	12	15	0	1	40	12	11	1	59	12	
S.	23	3 34	6	33	18	3	6	51	17	7	8	29	14	10	8	45	14	3	2	16	12	6	2	34	12	
S.	24	4 20	7	8	16	10	7	27	16	1	8	59	14	0	9	14	13	6	2	52	12	0	3	9	11	
M.	25	5 6	7	46	15	3	8	7	14	6	9	31	13	1	9	49	12	8	3	27	11	4	3	44	11	
Tu.	26	5 52	8	30	13	9	8	58	13	2	10	8	12	3	10	32	12	0	4	5	10	7	4	27	10	
W.	27	6 39	9	31	12	9	10	7	12	7	10	59	11	7	11	30	11	8	4	54	9	10	5	25	9	
Th.	28	7 26	10	50	12	6	11	33	12	8	—	—	—	—	0	7	11	3	5	59	9	5	6	40	9	
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							

Phases of the Moon.					Moon's Declination at Noon.											
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	4	6	16	Afternoon.	1	18	8.18	9	4	N.55	17	14	N.4	25	14	8.4
First Quarter -	12	1	40	Morning.	2	17	37	10	8	53	18	10	46	26	16	3
Full - - - - -	18	7	41	Afternoon.	3	16	7	11	12	26	19	6	56	27	17	4
Last Quarter -	26	11	32	Morning.	4	13	50	12	15	19	20	2	49	28	18	1
					5	10	52	13	17	19	21	1	8.20			
In Perigee - -	15	10	0	Morning.	6	7	21	14	18	14	22	5	18			
In Apogee - -	27	8	0	Morning.	7	3	25	15	17	58	23	8	56			
					8	0	N.44	16	16	32	24	12	5			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

FEBRUARY, 1867.

WEEK DAY.		MONTH DAY.		DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.									
				MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.											
				Time.		Height.		Time.		Height.		Time.		Height.											
F.	S.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.							
1	8	44	14	11	9	11	15	5	10	35	13	4	11	4	13	8	—	—	0	5	15	9	26.5		
2	9	35	15	10	9	57	16	3	11	30	14	0	11	52	14	3	0	33	16	0	0	58	16	4	27.5
3	10	18	16	9	10	38	17	1	—	—	0	12	14	7	1	19	16	9	1	40	17	1	28.5		
4	10	59	17	6	11	18	17	9	0	30	14	11	0	49	15	2	2	0	17	6	2	18	17	10	●
5	11	38	18	1	11	57	18	4	1	8	15	5	1	25	15	7	2	37	18	2	2	55	18	5	0.7
6	—	—	—	—	0	16	18	6	1	42	15	9	1	59	15	11	3	13	18	8	3	29	18	11	1.7
7	0	35	18	8	0	54	18	9	2	16	16	0	2	33	16	0	3	47	19	1	4	2	19	2	2.7
8	1	14	18	9	1	33	18	9	2	49	16	1	3	7	16	1	4	19	19	3	4	38	19	3	3.7
9	1	53	18	8	2	13	18	6	3	25	16	0	3	43	15	10	4	56	19	2	5	14	19	1	4.7
10	2	33	18	3	2	55	17	10	4	2	15	8	4	22	15	5	5	32	18	11	5	52	18	8	5.7
11	3	17	17	5	3	39	16	11	4	43	15	2	5	6	14	10	6	14	18	5	6	36	18	1	6.7
12	4	4	16	6	4	31	15	11	5	31	14	6	5	58	14	2	7	0	17	8	7	28	17	4	7.7
13	5	0	15	6	5	32	15	2	6	30	13	10	7	6	13	7	7	58	17	0	8	33	16	8	8.7
14	6	9	15	0	6	48	15	3	7	46	13	6	8	31	13	7	9	15	16	6	9	56	16	4	9.7
15	7	30	15	7	8	11	16	2	9	13	13	10	9	54	14	1	10	38	16	6	11	23	16	8	10.7
16	8	47	16	9	9	18	17	4	10	32	14	6	11	6	14	11	—	—	—	0	1	17	0	11.7	
17	9	47	17	10	10	14	18	5	11	35	15	4	—	—	—	0	0	34	17	5	1	4	17	10	12.7
18	10	40	18	10	11	4	19	2	0	2	15	8	0	26	16	1	1	30	18	4	1	57	18	9	○
19	11	28	19	5	11	51	19	6	0	50	16	4	1	12	16	6	2	20	19	2	2	42	19	5	14.7
20	—	—	—	—	0	14	19	7	1	33	16	8	1	54	16	9	3	4	19	8	3	25	19	10	15.7
21	0	35	19	6	0	56	19	5	2	15	16	9	2	34	16	8	3	44	19	11	4	3	19	10	16.7
22	1	17	19	3	1	37	18	11	2	52	16	6	3	10	16	4	4	23	19	9	4	41	19	7	17.7
23	1	56	18	7	2	14	18	3	3	27	16	1	3	45	15	10	4	57	19	4	5	17	19	0	18.7
24	2	32	17	9	2	50	17	2	4	3	15	6	4	21	15	2	5	34	18	8	5	52	18	4	19.7
25	3	8	16	8	3	26	16	0	4	38	14	8	4	57	14	3	6	8	17	11	6	27	17	5	20.7
26	3	46	15	5	4	8	14	10	5	16	13	10	5	39	13	6	6	48	17	0	7	9	16	6	21.7
27	4	33	14	3	5	1	13	9	6	5	13	1	6	35	12	8	7	33	16	1	8	3	15	8	22.7
28	5	32	13	6	6	9	13	4	7	10	12	6	7	48	12	5	8	37	15	5	9	16	15	3	23.7
Half Mean Spring Range.				9ft. 4in.				8ft. 0in.				9ft. 7in.													

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	50	Sub.	9	14	29	Sub.	17	14	17	Sub.	25	13	20	Sub.
2	13	58		10	14	30		18	14	12		26	13	10	
3	14	5		11	14	31		19	14	7		27	12	59	
4	14	11		12	14	30		20	14	0		28	12	48	
5	14	16		13	14	29		21	13	53					
6	14	20		14	14	27		22	13	46					
7	14	24		15	14	25		23	13	38					
8	14	27		16	14	21		24	13	29					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | **SHEERNESS** subtract 3 m. | **LONDON** 0 m.

TIDE TABLES FOR THE

FEBRUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	9m33	9 41	8 4	10 9	8 6	9 7	20 10	9 32	21 6	3 36	16 0	4 5	16 0
S.	2	10 21	10 33	8 8	10 54	8 10	9 54	22 2	10 14	22 5	4 31	17 4	4 56	17 8
☾	3	11 10	11 15	8 11	11 35	9 0	10 32	23 4	10 50	23 10	5 18	18 6	5 39	19 1
M.	4	11 58	11 56	9 2	—	—	11 9	24 4	11 27	24 8	6 0	19 6	6 19	19 11
Tu.	5	0a46	0 15	9 4	0 33	9 6	11 45	25 2	—	—	6 36	20 3	6 53	20 8
W.	6	1 34	0 50	9 7	1 9	9 8	0 2	25 6	0 20	25 9	7 11	20 10	7 28	21 0
Th.	7	2 22	1 27	9 9	1 44	9 9	0 38	25 11	0 55	26 1	7 45	21 0	8 3	21 6
F.	8	3 10	2 3	9 10	2 21	9 10	1 13	26 0	1 31	25 10	8 22	20 11	8 41	20 9
S.	9	3 59	2 39	9 9	2 58	9 8	1 50	25 7	2 9	25 3	9 0	20 5	9 20	20 1
☾	10	4 50	3 17	9 7	3 37	9 6	2 28	24 10	2 48	24 4	9 39	19 8	9 59	19 1
M.	11	5 43	3 59	9 4	4 22	9 2	3 9	23 9	3 33	23 1	10 20	18 7	10 44	18 0
Tu.	12	6 38	4 48	9 0	5 15	8 10	3 59	22 5	4 30	21 9	11 9	17 4	11 36	16 0
W.	13	7 35	5 48	8 8	6 24	8 7	5 5	21 3	5 46	21 0	—	—	0 8	16 0
Th.	14	8 34	7 5	8 5	7 47	8 6	6 32	21 0	7 17	21 4	0 46	16 4	1 31	16 0
F.	15	9 33	8 29	8 8	9 8	8 10	7 57	21 10	8 36	22 6	2 19	16 10	3 1	17 0
S.	16	10 31	9 45	9 0	10 16	9 3	9 9	23 4	9 37	24 2	3 40	18 3	4 14	19 0
☾	17	11 27	10 44	9 5	11 11	9 7	10 4	25 0	10 28	25 8	4 46	19 10	5 14	20 0
M.	18	morn.	11 37	9 8	—	—	10 51	26 2	11 13	26 7	5 41	21 1	6 5	21 0
Tu.	19	0 21	0 1	9 10	0 23	9 11	11 35	27 0	11 57	27 2	6 27	21 10	6 48	22 0
W.	20	1 12	0 45	10 0	1 7	10 1	—	—	0 18	27 3	7 9	22 2	7 29	22 0
Th.	21	2 1	1 28	10 1	1 47	10 0	0 38	27 2	0 58	27 0	7 47	21 10	8 6	21 0
F.	22	2 48	2 6	10 0	2 24	9 10	1 17	26 8	1 35	26 1	8 25	21 1	8 43	20 0
S.	23	3 34	2 42	9 9	2 59	9 7	1 52	25 6	2 9	24 10	9 1	20 1	9 19	19 0
☾	24	4 20	3 16	9 5	3 33	9 3	2 27	24 2	2 43	23 5	9 34	18 10	9 50	18 0
M.	25	5 6	3 50	9 1	4 8	8 10	3 0	22 8	3 19	21 10	10 7	17 5	10 26	16 0
Tu.	26	5 52	4 29	8 8	4 51	8 5	3 40	21 0	4 5	20 2	10 46	15 11	11 9	15 0
W.	27	6 39	5 19	8 2	5 51	8 0	4 35	19 5	5 9	18 11	11 37	14 8	—	—
Th.	28	7 26	6 25	7 11	7 6	7 9	5 48	18 9	6 34	18 9	0 9	14 4	0 47	14 0

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New - - - - -	4	6	16	Afternoon.
First Quarter	12	1	40	Morning.
Full - - - - -	18	7	41	Afternoon.
Last Quarter -	26	11	32	Morning.

In Perigee - -	15	10	0	Morning.
In Apogee - -	27	8	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	S. 18	9	4	N. 55	17	14	N. 4	25	14	S. 4
2	17	37	10	8	53	18	10	46	26	16	3
3	16	7	11	12	26	19	6	56	27	17	4
4	13	50	12	15	19	20	2	49	28	18	1
5	10	52	13	17	19	21	1	S. 20			
6	7	21	14	18	14	22	5	18			
7	3	25	15	17	58	23	8	56			
8	0	N. 44	16	16	32	24	12	5			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

FEBRUARY, 1867.

Month Day.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age at Noon.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.					
1	4 11 29	2	4 43 30	1	8 3 13	0	8 28 13	4	8 53 9	2	9 21 9	4	26°												
2	5 11 31	2	5 37 32	1	8 50 13	9	9 9 14	1	9 46 9	7	10 8 9	27°													
3	5 59 33	1	6 21 33	10	9 27 14	5	9 45 14	9	10 26 10	0	10 43 10	28°													
4	6 42 34	8	7 1 35	3	10 3 15	0	10 20 15	3	11 0 10	5	11 17 10	7													
5	7 19 35	11	7 37 36	6	10 36 15	6	10 52 15	9	11 33 10	9	11 50 10	0°													
6	7 55 36	11	8 12 37	3	11 8 15	10	11 24 15	11	—	—	0 8 10	1°													
7	8 29 37	4	8 46 37	5	11 40 16	0	11 59 15	11	0 26 10	11	0 44 10	2°													
8	9 3 37	4	9 20 37	2	—	—	0 19 15	10	1 3 10	10	1 22 10	3°													
9	9 37 36	9	9 55 36	2	0 39 15	9	1 0 15	6	1 42 10	8	2 2 10	4°													
10	10 13 35	6	10 31 34	7	1 22 15	3	1 45 15	0	2 23 10	4	2 45 10	5°													
11	10 49 33	7	11 11 32	7	2 9 14	7	2 34 14	3	3 9 10	0	3 34 9	6°													
12	11 36 31	6	—	—	3 3 13	10	3 36 13	6	4 1 9	7	4 35 9	5°													
13	0 8 30	8	0 44 30	1	4 13 13	3	4 55 13	2	5 12 9	3	5 49 9	8°													
14	1 25 29	11	2 8 30	2	5 38 13	2	6 18 13	5	6 27 9	2	7 5 9	9°													
15	2 51 30	8	3 35 31	7	6 56 13	8	7 32 14	0	7 43 9	6	8 21 9	10°													
16	4 17 32	9	4 53 34	0	8 5 14	6	8 33 15	0	8 57 10	0	9 29 10	11°													
17	5 27 35	3	5 55 36	6	8 59 15	5	9 23 15	10	9 58 10	6	10 22 10	12°													
18	6 22 37	4	6 47 38	0	9 46 16	2	10 7 16	5	10 43 11	0	11 4 11	2°													
19	7 10 38	6	7 32 38	11	10 27 16	7	10 47 16	9	11 24 11	4	11 45 11	14°													
20	7 54 39	1	8 13 39	0	11 6 16	9	11 24 16	8	—	—	0 7 11	15°													
21	8 31 38	9	8 49 38	4	11 43 16	6	—	—	0 27 11	3	0 46 11	16°													
22	9 6 37	9	9 23 37	0	0 3 16	4	0 23 16	0	1 6 11	1	1 26 10	17°													
23	9 39 36	3	9 54 35	3	0 42 15	8	1 1 15	3	1 45 10	8	2 3 10	18°													
24	10 8 34	2	10 22 33	0	1 21 14	10	1 40 14	5	2 21 10	2	2 40 9	19°													
25	10 36 31	9	10 53 30	6	2 0 13	11	2 20 13	5	3 0 9	8	3 20 9	20°													
26	11 13 29	3	11 39 28	1	2 44 13	0	3 10 12	6	3 42 9	2	4 9 8	21°													
27	—	—	0 11 27	4	3 42 12	2	4 18 11	11	4 40 8	7	5 15 8	22°													
28	0 45 26	9	1 26 26	8	4 57 11	9	5 39 11	10	5 49 8	4	6 27 8	23°													
Half Mean Spring Range.				18ft. 7in.				8ft. 0in.				5ft. 6in.													

Equation of Time at Noon.

LD.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	50		9	14	29		17	14	17		25	13	20	
2	13	58		10	14	30		18	14	12		26	13	10	
3	14	5		11	14	31		19	14	7		27	12	59	
4	14	11		12	14	30		20	14	0		28	12	48	
5	14	16		13	14	29		21	13	53					
6	14	20		14	14	27		22	13	46					
7	14	24		15	14	25		23	13	38					
8	14	27		16	14	21		24	13	29					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required.—

WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Tm

FEBRUARY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	9m 33	8 37	8 2	9 2	8 4	5 51	6 2	6 13	6 4	3 9	8 8	3 33	8 11
S.	2	10 21	9 24	8 6	9 44	8 9	6 34	6 6	6 54	6 8	3 53	9 3	4 11	9 7
S.	3	11 10	10 3	8 11	10 21	9 0	7 14	6 10	7 34	7 0	4 29	9 11	4 47	10 0
M.	4	11 58	10 39	9 2	10 56	9 3	7 53	7 2	8 10	7 4	5 6	10 6	5 24	10 8
Tu.	5	12 46	11 12	9 3	11 29	9 4	8 26	7 6	8 42	7 7	5 42	10 11	5 59	11 2
W.	6	1 34	11 45	9 4	—	—	8 58	7 8	9 13	7 8	6 16	11 2	6 31	11 8
Th.	7	2 22	0 1	9 5	0 19	9 5	9 29	7 7	9 46	7 6	6 49	11 1	7 8	11 6
F.	8	3 10	0 38	9 5	0 58	9 5	10 4	7 5	10 22	7 4	7 27	10 11	7 45	10 9
S.	9	3 59	1 18	9 4	1 39	9 4	10 41	7 3	11 1	7 1	8 4	10 6	8 24	10 8
S.	10	4 50	2 1	9 3	2 26	9 1	11 24	6 11	11 53	6 8	8 46	10 0	9 10	9 8
M.	11	5 43	2 51	8 11	3 17	8 9	—	—	0 24	6 4	9 38	9 5	10 10	9 8
Tu.	12	6 38	3 45	8 7	4 17	8 6	1 1	6 1	1 40	6 0	10 45	8 11	11 23	8 10
W.	13	7 35	4 52	8 5	5 29	8 3	2 25	5 11	3 6	5 11	—	—	0 2	8 8
Th.	14	8 34	6 8	8 3	6 49	8 3	3 46	6 1	4 22	6 4	0 42	8 9	1 23	8 10
F.	15	9 33	7 29	8 4	8 6	8 6	4 54	6 6	5 23	6 9	2 2	9 1	2 39	9 8
S.	16	10 31	8 39	8 9	9 7	9 0	5 51	6 11	6 18	7 2	3 10	9 9	3 37	10 8
S.	17	11 27	9 34	9 3	9 58	9 5	6 44	7 5	7 10	7 8	4 1	10 7	4 24	11 8
M.	18	morn.	10 22	9 7	10 43	9 8	7 34	7 10	7 57	7 11	4 47	11 3	5 10	11 8
Tu.	19	0 21	11 3	9 8	11 24	9 9	8 17	8 1	8 37	8 2	5 32	11 8	5 54	11 8
W.	20	1 12	11 44	9 8	—	—	8 56	8 2	9 14	8 0	6 14	11 9	6 32	11 8
Th.	21	2 1	0 2	9 8	0 21	9 7	9 32	7 11	9 50	7 9	6 51	11 6	7 11	11 8
F.	22	2 48	0 42	9 7	1 2	9 6	10 7	7 6	10 24	7 4	7 30	11 0	7 48	10 8
S.	23	3 34	1 21	9 4	1 40	9 3	10 42	7 1	11 0	6 10	8 5	10 4	8 23	10 8
S.	24	4 20	2 0	9 1	2 21	8 11	11 20	6 7	11 44	6 3	8 41	9 7	9 1	9 8
M.	25	5 6	2 42	8 8	3 3	8 6	—	—	0 9	5 11	9 24	8 10	9 50	8 6
Tu.	26	5 52	3 26	8 3	3 52	8 2	0 40	5 7	1 12	5 5	10 18	8 3	10 51	7 11
W.	27	6 39	4 22	8 0	4 56	7 10	1 50	5 3	2 30	5 2	11 27	7 10	—	—
Th.	28	7 26	5 31	7 9	6 9	7 9	3 8	5 3	3 46	5 5	0 3	7 9	0 43	7 9
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			

Phases of the Moon.				Moon's Declination at Noon.			
	D.	H.	M.	M.D.	°	'	
New - - - - -	4	6	16 Afternoon.	1	18	18	9 4 N. 55
First Quarter	12	1	40 Morning.	2	17	37	10 8 53
Full - - - - -	18	7	41 Afternoon.	3	16	7	11 12 26
Last Quarter -	26	11	32 Morning.	4	13	50	12 15 19
				5	10	52	13 17 19
In Perigee - -	15	10	0 Morning.	6	7	21	14 18 14
In Apogee - -	27	8	0 Morning.	7	3	25	15 17 58
				8	0	N. 44	16 16 32
							24 12 5

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2m. | LONDONDERRY add 4m. | SLIGO BAY add 9m.

FEBRUARY, 1867.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
F.	1	3	20	11	3	2	45	11	8	2	32	9	3	3	1	9	7	2	42	10	1	3	13	10	4	26.5
S.	2	3	8	12	1	3	30	12	5	3	25	9	10	3	48	10	2	3	40	10	8	4	6	10	11	27.5
M.	3	3	49	12	10	4	7	13	2	4	9	10	5	4	29	10	8	4	28	11	3	4	50	11	5	28.5
Tu.	4	4	26	13	7	4	43	13	11	4	49	10	11	5	7	11	2	5	11	11	8	5	30	11	10	●
W.	5	4	59	14	3	5	16	14	6	5	25	11	5	5	43	11	7	5	47	12	0	6	4	12	2	0.7
Th.	6	5	34	14	8	5	53	14	9	6	2	11	8	6	20	11	9	6	22	12	4	6	40	12	5	1.7
F.	7	6	11	14	10	6	29	14	9	6	37	11	9	6	55	11	9	6	58	12	6	7	17	12	6	2.7
S.	8	6	47	14	8	7	7	14	6	7	13	11	9	7	32	11	7	7	35	12	6	7	53	12	5	3.7
M.	9	7	27	14	4	7	47	14	1	7	51	11	5	8	10	11	3	8	10	12	4	8	29	12	3	4.7
Tu.	10	8	10	13	9	8	34	13	3	8	29	11	1	8	49	10	9	8	48	12	1	9	7	11	10	5.7
W.	11	8	59	12	9	9	26	12	3	9	11	10	6	9	35	10	2	9	27	11	6	9	50	11	2	6.7
Th.	12	9	56	11	10	10	31	11	7	10	1	9	11	10	32	9	8	10	19	10	11	10	54	10	7	7.7
F.	13	11	10	11	5	11	54	11	6	11	9	9	7	11	51	9	6	11	30	10	4	—	—	—	—	8.7
S.	14	—	—	—	—	0	35	11	8	—	—	—	—	0	33	9	7	0	8	10	3	0	46	10	4	9.7
M.	15	1	14	11	11	1	50	12	5	1	15	9	9	1	58	10	0	1	25	10	6	2	6	10	9	10.7
Tu.	16	2	22	12	11	2	51	13	5	2	36	10	5	3	8	10	9	2	47	11	2	3	23	11	6	11.7
W.	17	3	19	13	11	3	44	14	5	3	38	11	2	4	5	11	6	3	56	11	11	4	24	12	3	12.7
Th.	18	4	8	14	9	4	30	15	2	4	31	11	9	4	54	12	0	4	52	12	6	5	16	12	8	13.7
F.	19	4	50	15	5	5	12	15	7	5	16	12	2	5	38	12	3	5	38	12	10	5	59	12	11	14.7
S.	20	5	34	15	8	5	53	15	7	6	0	12	4	6	20	12	3	6	20	13	0	6	40	13	0	15.7
M.	21	6	12	15	5	6	32	15	2	6	39	12	2	6	58	12	1	7	0	12	11	7	20	12	10	16.7
Tu.	22	6	51	14	10	7	10	14	6	7	17	11	10	7	35	11	7	7	38	12	8	7	55	12	5	17.7
W.	23	7	28	14	1	7	46	13	8	7	52	11	3	8	9	11	0	8	11	12	2	8	27	11	11	18.7
Th.	24	8	5	13	1	8	25	12	6	8	25	10	8	8	40	10	4	8	43	11	8	8	58	11	4	19.7
F.	25	8	45	11	11	9	7	11	3	8	57	9	11	9	17	9	7	9	14	10	11	9	32	10	7	20.7
S.	26	9	31	10	9	10	1	10	4	9	38	9	2	10	4	8	11	9	54	10	2	10	24	9	10	21.7
M.	27	10	35	10	1	11	12	9	11	10	35	8	8	11	10	8	6	10	57	9	7	11	30	9	4	22.7
Tu.	28	11	55	10	0	—	—	—	—	11	52	8	6	—	—	—	—	—	—	—	—	0	8	9	2	23.7
		Half Mean Spring } Range. } 7ft. 5in.								5ft. 10in.								6ft. 2in.								

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	13 50	Sub.	9	14 29	Sub.	17	14 17	Sub.	25	13 20	Sub.
2	13 58		10	14 30		18	14 12		26	13 10	
3	14 5		11	14 31		19	14 7		27	12 59	
4	14 11		12	14 30		20	14 0		28	12 48	
5	14 16		13	14 29		21	13 53				
6	14 20		14	14 27		22	13 46				
7	14 24		15	14 25		23	13 38				
8	14 27		16	14 21		24	13 29				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

MARCH, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
F.	1	8 m 14	—	—	0 13	12 11	0 45	11 8	1 23	11 6	7 22	9 6	8 1	9 8
S.	2	9 2	0 50	13 5	1 21	14 1	2 4	12 3	2 41	12 2	8 39	10 0	9 12	10 4
S.	3	9 50	1 48	14 10	2 10	15 7	3 14	13 1	3 45	13 0	9 39	10 9	10 3	11 8
M.	4	10 38	2 30	16 5	2 49	17 1	4 10	13 11	4 35	13 9	10 25	11 5	10 44	11 11
Tu.	5	11 27	3 7	17 10	3 25	18 5	4 56	14 9	5 18	14 6	11 3	12 1	11 21	12 8
W.	6	0 a 16	3 43	18 11	4 1	19 4	5 38	15 4	5 57	15 1	11 40	12 7	11 58	12 6
Th.	7	1 5	4 20	19 8	4 38	19 10	6 17	15 10	6 36	15 6	—	—	0 16	12 11
F.	8	1 55	4 56	20 0	5 15	20 0	6 55	16 0	7 13	15 7	0 36	13 0	0 56	13 8
S.	9	2 46	5 34	19 10	5 53	19 8	7 32	15 10	7 50	15 6	1 16	13 1	1 35	13 8
S.	10	3 39	6 12	19 5	6 33	18 11	8 9	15 6	8 29	15 2	1 55	12 11	2 13	13 11
M.	11	4 34	6 55	18 4	7 17	17 8	8 50	15 0	9 10	14 8	2 34	12 7	2 56	12 11
Tu.	12	5 31	7 42	16 10	8 9	16 0	9 30	14 4	9 54	14 0	3 18	12 1	3 41	11 11
W.	13	6 28	8 38	15 3	9 10	14 9	10 22	13 6	10 51	13 4	4 7	11 4	4 35	11 11
Th.	14	7 26	9 49	14 5	10 36	14 3	11 25	12 9	—	—	5 6	10 8	5 43	10 11
F.	15	8 23	11 24	14 5	—	—	0 1	12 11	0 46	12 7	6 27	10 3	7 13	10 11
S.	16	9 18	0 8	14 9	0 46	15 4	1 30	13 2	2 14	13 0	7 55	10 7	8 36	10 11
S.	17	10 11	1 22	16 0	1 49	16 10	2 51	13 11	3 28	13 9	9 13	11 4	9 42	11 11
M.	18	11 2	2 15	17 7	2 40	18 3	3 57	14 9	4 26	14 6	10 10	12 1	10 35	12 11
Tu.	19	11 51	3 0	18 11	3 21	19 5	4 51	15 5	5 15	15 1	10 56	12 7	11 17	12 11
W.	20	morn.	3 41	19 8	4 0	19 10	5 36	15 11	5 56	15 6	11 37	12 11	11 56	13 11
Th.	21	0 39	4 18	19 11	4 37	19 10	6 17	16 0	6 36	15 8	—	—	0 14	13 11
F.	22	1 25	4 54	19 8	5 11	19 5	6 55	15 11	7 11	15 6	0 34	13 0	0 53	12 11
S.	23	2 12	5 28	19 1	5 45	18 8	7 25	15 4	7 41	15 0	1 12	12 9	1 28	12 11
S.	24	2 58	6 2	18 2	6 18	17 8	7 56	14 9	8 12	14 5	1 46	12 5	2 3	12 11
M.	25	3 45	6 35	17 1	6 53	16 4	8 28	14 0	8 42	13 8	2 19	12 0	2 36	11 11
Tu.	26	4 31	7 12	15 8	7 33	14 11	8 56	13 2	9 13	12 11	2 53	11 5	3 12	11 11
W.	27	5 18	7 53	14 3	8 15	13 7	9 32	12 4	9 52	12 3	3 31	10 9	3 51	10 11
Th.	28	6 6	8 43	13 0	9 18	12 8	10 16	11 8	10 43	11 9	4 12	10 2	4 39	9 11
F.	29	6 53	9 57	12 6	10 38	12 7	11 15	11 2	11 54	11 8	5 12	9 7	5 49	9 11
S.	30	7 41	11 23	12 9	—	—	—	—	0 33	11 3	6 28	9 4	7 12	9 11
S.	31	8 29	0 3	13 2	0 39	13 9	1 16	12 1	1 57	11 11	7 50	9 9	8 27	10 11
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			

Phases of the Moon.

	D.	H.	M.	
New- - - - -	6	9	38	Morning.
First Quarter- -	13	8	47	Morning.
Full - - - - -	20	8	55	Morning.
Last Quarter - -	28	7	46	Morning.
—				
In Perigee - -	12	11	0	Afternoon.
In Apogee - -	27	4	0	Morning.

Moon's Declination at Noon.

M.D.	0	1	M.D.	0	1	M.D.	0	1	M.D.	0	1
1	17	S. 51	9	7	N. 52	17	11	N. 56	25	16	S. 0
2	16	39	10	11	36	18	8	21	26	17	28
3	14	39	11	14	40	19	4	22	27	18	10
4	11	55	12	16	53	20	0	15	28	18	4
5	8	33	13	18	3	21	3	S. 49	29	17	10
6	4	41	14	18	5	22	7	36	30	15	28
7	0	31	15	17	0	23	10	59	31	13	1
8	3	N. 45	16	14	54	24	13	49			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
Brest add 18 m. | Devonport add 17 m. | Portsmouth add 4 m.

MARCH, 1867.

WEEK DAY. MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C'S AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.							
1	11 51	9 4	—	—	10 45	11 10	11 20	12 1	4 44	8 8	5 21	8 9	24.7												
2	0 27	9 7	1 0	9 11	11 53	12 5	—	—	5 55	9 1	6 24	9 7	25.7												
3	1 28	10 3	1 51	10 8	0 22	12 10	0 45	13 4	6 47	10 1	7 5	10 8	26.7												
4	2 11	11 1	2 30	11 6	1 5	13 11	1 25	14 5	7 22	11 3	7 38	11 10	27.7												
5	2 48	12 0	3 6	12 5	1 44	14 11	2 3	15 5	7 53	12 4	8 9	12 10	28.7												
6	3 22	12 9	3 40	13 1	2 21	15 10	2 39	16 3	8 27	13 3	8 44	13 6	29.7												
7	3 58	13 5	4 16	13 7	2 56	16 6	3 13	16 9	9 1	13 8	9 19	13 9	30.7												
8	4 34	13 9	4 52	13 9	3 30	16 10	3 48	16 10	9 38	13 10	9 57	13 9	31.7												
9	5 12	13 8	5 33	13 6	4 7	16 9	4 27	16 8	10 17	13 7	10 37	13 5	32.7												
10	5 53	13 4	6 12	13 2	4 47	16 6	5 7	16 3	10 57	13 2	11 20	12 9	33.7												
11	6 34	12 11	6 56	12 7	5 28	16 0	5 52	15 7	11 44	12 5	—	—	34.7												
12	7 19	12 3	7 47	11 9	6 16	15 2	6 43	14 7	0 8	11 11	0 35	11 5	35.7												
13	8 18	11 3	8 51	10 9	7 12	14 1	7 47	13 7	1 4	10 11	1 37	10 6	36.7												
14	9 29	10 5	10 13	10 3	8 23	13 3	9 5	13 0	2 14	10 2	2 57	9 11	37.7												
15	10 58	10 3	11 42	10 5	9 53	12 11	10 36	13 1	3 49	9 10	4 35	9 10	38.7												
16	—	—	0 21	10 9	11 14	13 4	11 49	13 9	5 16	10 0	5 51	10 5	39.7												
17	0 55	11 1	1 27	11 6	—	—	0 21	14 2	6 23	10 11	6 46	11 6	40.7												
18	1 52	11 10	2 17	12 4	0 46	14 9	1 11	15 3	7 9	12 1	7 29	12 8	41.7												
19	2 40	12 9	2 59	13 1	1 35	15 9	1 56	16 2	7 47	13 2	8 5	13 6	42.7												
20	3 18	13 4	3 37	13 7	2 16	16 6	2 36	16 9	8 24	13 9	8 42	13 10	43.7												
21	3 56	13 8	4 14	13 9	2 54	16 10	3 11	16 10	8 59	13 10	9 16	13 9	44.7												
22	4 32	13 8	4 51	13 6	3 28	16 9	3 46	16 7	9 35	13 7	9 53	13 4	45.7												
23	5 9	13 3	5 26	13 0	4 3	16 4	4 20	16 11	10 10	13 1	10 29	12 9	46.7												
24	5 44	12 9	6 2	12 5	4 39	15 9	4 57	15 5	10 47	12 4	11 4	11 11	47.7												
25	6 19	12 2	6 36	11 9	5 13	15 1	5 31	14 8	11 23	11 6	11 42	11 0	48.7												
26	6 54	11 5	7 15	11 0	5 50	14 3	6 12	13 9	—	—	0 3	10 7	49.7												
27	7 38	10 6	8 2	10 1	6 34	13 3	6 57	12 10	0 25	10 1	0 48	9 9	50.7												
28	8 28	9 8	9 1	9 4	7 22	12 5	7 55	12 1	1 13	9 4	1 46	9 0	51.7												
29	9 40	9 2	10 19	9 1	8 32	11 10	9 14	11 8	2 24	8 9	3 7	8 7	52.7												
30	10 59	9 3	11 41	9 5	9 55	11 9	10 34	12 0	3 51	8 8	4 34	8 9	53.7												
31	—	—	0 17	9 9	11 10	12 3	11 42	12 8	5 11	9 0	5 44	9 4	54.7												
Mean Spring Range.				6ft. 8in.				8ft. 2in.				6ft. 7in.													

Mean Spring
Range.

6ft. 8in.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
12 37	Sub.	9	10 48	Sub.	17	8 36	Sub.	25	6 11	Sub.
12 25		10	10 33		18	8 19		26	5 53	
			10 17		19	8 1		27	5 34	
			10 1		20	7 43		28	5 16	
			9 45		21	7 25		29	4 57	
			9 28		22	7 6		30	4 39	
			9 11		23	6 48		31	4 21	
			8 54		24	6 30				

for Mean Time at Place; if Greenwich or Railway Time be required—for

LEITH add 13 m.

THURSO add 14 m.

MARCH, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	8m 14	7 40	9 3	8 21	9 4	2 7	15 3	2 45	15 5	11 39	10 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S.	2	9 2	8 58	9 6	9 34	9 9	3 20	15 10	3 55	16 6	0 13	10 7	0 46	10 11	—	—	—	—	—	—	—	—	—	—	—	—
S.	3	9 50	10 4	10 0	10 31	10 4	4 26	17 1	4 51	17 9	1 16	11 5	1 41	11 11	—	—	—	—	—	—	—	—	—	—	—	—
M.	4	10 38	10 54	10 7	11 14	10 10	5 12	18 4	5 31	18 11	2 4	12 4	2 26	12 9	—	—	—	—	—	—	—	—	—	—	—	—
Tu.	5	11 27	11 33	11 1	11 52	11 3	5 50	19 5	6 9	19 11	2 46	13 1	3 5	13 6	—	—	—	—	—	—	—	—	—	—	—	—
W.	6	0a 16	—	—	0 11	11 6	6 27	20 3	6 46	20 8	3 22	13 10	3 39	14 1	—	—	—	—	—	—	—	—	—	—	—	—
Th.	7	1 5	0 30	11 7	0 47	11 9	7 5	21 1	7 24	21 4	3 57	14 6	4 15	14 9	—	—	—	—	—	—	—	—	—	—	—	—
F.	8	1 55	1 5	11 10	1 24	11 10	7 43	21 7	8 1	21 8	4 33	14 11	4 51	15 0	—	—	—	—	—	—	—	—	—	—	—	—
S.	9	2 46	1 42	11 10	2 1	11 10	8 20	21 9	8 39	21 7	5 10	14 11	5 29	14 10	—	—	—	—	—	—	—	—	—	—	—	—
S.	10	3 39	2 21	11 9	2 40	11 7	8 58	21 5	9 17	21 1	5 48	14 7	6 8	14 4	—	—	—	—	—	—	—	—	—	—	—	—
M.	11	4 34	2 59	11 6	3 21	11 4	9 39	20 7	10 1	20 1	6 30	14 0	6 54	13 1	—	—	—	—	—	—	—	—	—	—	—	—
Tu.	12	5 31	3 42	11 1	4 3	10 11	10 23	19 6	10 48	18 11	7 18	13 3	7 44	12 11	—	—	—	—	—	—	—	—	—	—	—	—
W.	13	6 28	4 27	10 8	4 54	10 5	11 20	18 3	11 55	17 8	8 13	12 4	8 44	11 11	—	—	—	—	—	—	—	—	—	—	—	—
Th.	14	7 26	5 24	10 2	5 56	10 0	—	—	0 33	17 2	9 19	11 7	10 0	11 5	—	—	—	—	—	—	—	—	—	—	—	—
F.	15	8 23	6 35	9 11	7 26	9 11	1 13	16 10	1 54	16 9	10 46	11 3	11 30	11 1	—	—	—	—	—	—	—	—	—	—	—	—
S.	16	9 18	8 12	10 0	8 53	10 3	2 37	17 0	3 15	17 6	—	—	0 7	11 1	—	—	—	—	—	—	—	—	—	—	—	—
S.	17	10 11	9 30	10 6	10 5	10 9	3 51	18 2	4 25	18 10	0 42	12 2	1 15	12 1	—	—	—	—	—	—	—	—	—	—	—	—
M.	18	11 2	10 33	11 0	11 0	11 3	4 52	19 5	5 17	20 0	1 43	13 1	2 11	13 1	—	—	—	—	—	—	—	—	—	—	—	—
Tu.	19	11 51	11 24	11 6	11 46	11 8	5 41	20 6	6 2	20 10	2 36	13 10	2 57	14 1	—	—	—	—	—	—	—	—	—	—	—	—
W.	20	morn.	—	—	0 7	11 10	6 24	21 2	6 44	21 4	3 17	14 5	3 36	14 1	—	—	—	—	—	—	—	—	—	—	—	—
Th.	21	0 39	0 27	11 11	0 45	11 11	7 4	21 6	7 22	21 7	3 55	14 10	4 13	14 1	—	—	—	—	—	—	—	—	—	—	—	—
F.	22	1 25	1 3	11 11	1 22	11 10	7 41	21 6	8 0	21 4	4 31	14 11	4 49	14 1	—	—	—	—	—	—	—	—	—	—	—	—
S.	23	2 12	1 40	11 9	1 57	11 7	8 16	21 2	8 32	20 11	5 6	14 7	5 22	14 1	—	—	—	—	—	—	—	—	—	—	—	—
S.	24	2 58	2 14	11 5	2 32	11 3	8 49	20 6	9 7	20 0	5 40	14 0	5 58	13 1	—	—	—	—	—	—	—	—	—	—	—	—
M.	25	3 45	2 49	11 0	3 6	10 10	9 24	19 6	9 41	18 11	6 15	13 3	6 33	12 1	—	—	—	—	—	—	—	—	—	—	—	—
Tu.	26	4 31	3 23	10 7	3 40	10 5	9 58	18 4	10 18	17 9	6 52	12 5	7 13	12 1	—	—	—	—	—	—	—	—	—	—	—	—
W.	27	5 18	3 58	10 2	4 17	9 11	10 39	17 2	11 4	16 8	7 35	11 7	7 57	11 1	—	—	—	—	—	—	—	—	—	—	—	—
Th.	28	6 6	4 38	9 9	5 1	9 6	11 31	16 2	—	—	8 21	10 11	8 52	10 1	—	—	—	—	—	—	—	—	—	—	—	—
F.	29	6 53	5 28	9 4	6 4	9 3	0 5	15 8	0 41	15 4	9 28	10 4	10 8	10 1	—	—	—	—	—	—	—	—	—	—	—	—
S.	30	7 41	6 45	9 3	7 27	9 3	1 18	15 2	1 55	15 3	10 48	10 3	11 28	10 1	—	—	—	—	—	—	—	—	—	—	—	—
S.	31	8 29	8 11	9 5	8 48	9 8	2 35	15 6	3 10	16 1	—	—	0 3	10 1	—	—	—	—	—	—	—	—	—	—	—	—

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.			
	D.	H.	M.
New	6	9	38 Morning.
First Quarter	13	8	47 Morning.
Full	20	8	55 Morning.
Last Quarter	28	7	46 Morning.
In Perigee - 12 11 0 Afternoon.			
In Apogeo - 27 4 0 Morning.			

Moon's Declination at Noon.			
M.D.	°	'	°
1	17	S. 51	9
2	16	39	10
3	14	39	11
4	11	55	12
5	8	33	13
6	4	41	14
7	0	31	15
8	3	N. 45	16
9	7	N. 52	17
10	11	36	18
11	14	40	19
12	16	53	20
13	18	3	21
14	18	5	22
15	17	0	23
16	14	54	24
17	11	N. 56	25
18	8	21	26
19	4	22	27
20	0	15	28
21	3	S. 49	29
22	7	36	30
23	10	59	31
24	13	49	

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, -
HARWICH subtrac' 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MARCH, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
F	1	2 8 26 9	2 48 27 2	6 19 11 11	6 54 12 2	7 6 8 6	7 41 8 8	24.7						
S	2	3 26 28 0	4 2 29 0	7 27 12 6	7 56 12 11	8 15 8 11	8 46 9 2	25.7						
M	3	4 34 30 2	5 1 31 5	8 20 13 5	8 41 13 10	9 13 9 5	9 37 9 8	26.7						
Th	4	5 26 32 8	5 49 33 9	9 0 14 4	9 18 14 9	9 59 9 11	10 17 10 2	27.7						
F	5	6 11 34 11	6 31 35 10	9 36 15 2	9 54 15 6	10 34 10 5	10 51 10 8	28.7						
S	6	6 52 36 8	7 11 37 5	10 12 15 10	10 29 16 2	11 8 10 11	11 26 11 1	●						
M	7	7 30 38 1	7 49 38 7	10 45 16 5	11 2 16 6	11 44 11 2	—	1.1						
Th	8	8 7 38 10	8 26 38 11	11 18 16 7	11 37 16 7	0 2 11 3	0 21 11 3	2.1						
F	9	8 44 38 9	9 2 38 6	11 58 16 6	—	0 41 11 3	1 1 11 2	3.1						
S	10	9 20 38 11	9 39 37 5	0 18 16 4	0 39 16 1	1 21 11 0	1 41 10 10	4.1						
M	11	9 58 36 6	10 16 35 6	1 2 15 10	1 26 15 5	2 3 10 8	2 26 10 5	5.1						
Th	12	10 34 34 3	10 56 33 0	1 50 15 0	2 16 14 6	2 49 10 3	3 15 10 0	6.1						
F	13	11 21 31 8	11 51 30 7	2 45 14 0	3 18 13 7	3 44 9 8	4 17 9 5	7.1						
S	14	—	0 29 29 9	3 55 13 3	4 38 13 0	4 53 9 2	5 33 9 0	8.1						
M	15	1 12 29 6	1 59 29 7	5 26 13 0	6 10 13 2	6 15 9 0	6 57 9 2	9.1						
Th	16	2 42 30 2	3 24 31 1	6 48 13 5	7 23 13 9	7 35 9 5	8 11 9 7	10.1						
F	17	4 5 32 2	4 39 33 5	7 55 14 3	8 21 14 9	8 46 9 10	9 15 10 2	11.1						
S	18	5 12 34 8	5 40 35 9	8 47 15 2	9 9 15 7	9 44 10 5	10 9 10 7	12.1						
M	19	6 4 36 8	6 28 37 4	9 29 15 11	9 49 16 2	10 28 10 10	10 47 11 0	13.1						
Th	20	6 50 37 10	7 10 38 2	10 9 16 5	10 27 16 6	11 5 11 2	11 23 11 3	○						
F	21	7 28 38 5	7 47 38 6	10 43 16 6	11 0 16 6	11 41 11 3	12 0 11 2	15.1						
S	22	8 5 38 3	8 22 37 10	11 17 16 4	11 33 16 2	—	0 19 11 1	16.1						
M	23	8 37 37 5	8 53 36 10	11 51 15 11	—	0 37 11 0	0 54 10 10	17.1						
Th	24	9 9 36 1	9 25 35 4	0 10 15 8	0 28 15 3	1 13 10 8	1 31 10 5	18.1						
F	25	9 39 34 5	9 53 33 4	0 47 14 11	1 5 14 6	1 48 10 2	2 5 9 11	19.1						
S	26	10 8 32 3	10 24 31 1	1 24 14 0	1 45 13 7	2 24 9 9	2 45 9 6	20.1						
M	27	10 40 30 0	10 59 28 11	2 7 13 2	2 30 12 9	3 6 9 3	3 28 9 0	21.1						
Th	28	11 25 27 11	11 58 27 1	2 54 12 5	3 27 12 1	3 53 8 10	4 25 8 7	☾						
F	29	—	0 34 26 7	4 5 11 10	4 47 11 9	5 1 8 5	5 38 8 4	23.1						
S	30	1 13 26 8	1 58 27 0	5 27 11 10	6 8 12 1	6 16 8 5	6 55 8 7	24.1						
M	31	2 37 27 8	3 15 28 7	6 44 12 4	7 16 12 9	7 31 8 9	8 4 9 0	25.1						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	12 37	Sub.	9	10 48	Sub.	17	8 36	Sub.	25	6 11	Sub.
2	12 25		10	10 33		18	8 19		26	5 53	
3	12 12		11	10 17		19	8 1		27	5 34	
4	12 0		12	10 1		20	7 43		28	5 16	
5	11 46		13	9 45		21	7 25		29	4 57	
6	11 32		14	9 28		22	7 6		30	4 39	
7	11 18		15	9 11		23	6 48		31	4 21	
8	11 3		16	8 54		24	6 30				

The times of High Water are given for Mean Tim at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

MARCH, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																							
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
F.	1	8m 14	7 47	7 10	8 25	7 11	7 17	18 11	7 55	19 4	1 31	14 4	2 14	14																													
S.	2	9 2	9 2	8 1	9 34	8 4	8 31	20 0	9 0	20 9	2 54	15 3	3 28	15																													
S.	3	9 50	10 1	8 6	10 24	8 9	9 24	21 7	9 45	22 5	3 56	16 9	4 22	17																													
M.	4	10 38	10 45	8 11	11 5	9 1	10 5	23 2	10 23	23 10	4 45	18 3	5 8	18																													
Tu.	5	11 27	11 26	9 3	11 46	9 5	10 41	24 6	11 0	25 1	5 30	19 7	5 50	20																													
W.	6	oa 16	—	—	0 6	9 7	11 18	25 8	11 37	26 3	6 10	20 8	6 29	21																													
Th.	7	1 5	0 25	9 9	0 44	9 11	11 56	26 7	—	—	6 47	21 6	7 6	21																													
F.	8	1 55	1 3	10 0	1 22	10 1	0 15	26 10	0 33	27 1	7 24	22 0	7 42	21																													
S.	9	2 46	1 42	10 1	2 1	10 0	0 53	27 1	1 12	26 11	8 1	21 9	8 20	21																													
S.	10	3 39	2 20	10 0	2 39	9 11	1 30	26 8	1 48	26 3	8 39	21 3	9 1	20																													
M.	11	4 34	2 59	9 10	3 20	9 8	2 9	25 8	2 30	25 1	9 22	20 4	9 42	19																													
Tu.	12	5 31	3 41	9 6	4 4	9 3	2 51	24 4	3 15	23 7	10 4	18 11	10 29	18																													
W.	13	6 28	4 31	9 1	4 59	8 11	3 42	22 8	4 12	21 10	10 54	17 5	11 21	16																													
Th.	14	7 26	5 31	8 8	6 9	8 6	4 47	21 2	5 29	20 9	11 54	16 3	—	—																													
F.	15	8 23	6 53	8 4	7 38	8 4	6 19	20 8	7 7	20 11	0 34	16 0	1 22	16																													
S.	16	9 18	8 20	8 6	8 58	8 9	7 49	21 5	8 27	22 2	2 9	16 6	2 51	17																													
S.	17	10 11	9 34	8 11	10 3	9 2	8 59	22 11	9 25	23 9	3 30	17 11	4 1	18																													
M.	18	11 2	10 31	9 4	10 56	9 5	9 51	24 7	10 14	25 3	4 31	19 6	4 59	20																													
Tu.	19	11 51	11 19	9 7	11 41	9 9	10 34	25 9	10 55	26 2	5 24	20 8	5 47	21																													
W.	20	morn.	—	—	0 3	9 10	11 15	26 6	11 35	26 9	6 7	21 5	6 26	21																													
Th.	21	0 39	0 23	9 11	0 42	9 11	11 53	26 10	—	—	6 44	21 9	7 3	21																													
F.	22	1 25	1 1	9 11	1 21	9 11	0 12	26 10	0 31	26 8	7 21	21 7	7 38	21																													
S.	23	2 12	1 38	9 10	1 54	9 9	0 49	26 5	1 5	26 0	7 55	21 0	8 12	20																													
S.	24	2 58	2 11	9 8	2 28	9 7	1 22	25 6	1 38	24 11	8 29	20 1	8 46	19																													
M.	25	3 45	2 45	9 5	3 1	9 3	1 54	24 3	2 11	23 7	9 3	19 0	9 19	18																													
Tu.	26	4 31	3 17	9 1	3 35	8 11	2 28	22 10	2 46	22 1	9 37	17 8	9 55	17																													
W.	27	5 18	3 55	8 8	4 15	8 6	3 6	21 4	3 26	20 8	10 13	16 5	10 32	15																													
Th.	28	6 6	4 36	8 4	5 4	8 2	3 49	19 11	4 20	19 3	10 55	15 1	11 24	14																													
F.	29	6 53	5 38	8 0	6 15	7 10	4 56	18 10	5 38	18 8	11 58	14 3	—	—																													
S.	30	7 41	6 54	7 10	7 37	7 10	6 21	18 9	7 7	19 1	0 35	14 3	1 21	14																													
S.	31	8 29	8 15	8 0	8 52	8 3	7 44	19 8	8 19	20 5	2 3	14 11	2 42	15																													
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.																																
Phases of the Moon.																						Moon's Declination at Noon.																					
D. H. M.																						M.D. ° ' "																					
New	-	-	-	-	6	9	38	Morning.	1	17	8.51	9	7 N.	52	17	11 N.	56	25	16 S.	0																							
First Quarter	-	13	8	47	Morning.	2	16	39	10	11	36	18	8	21	26	17	23																										
Full	-	-	-	-	20	8	55	Morning.	3	14	39	11	14	40	19	4	22	27	18	10																							
Last Quarter	-	28	7	46	Morning.	4	11	55	12	16	53	20	0	15	28	18	4																										
In Perigee	-	-	12	11	0	Afternoon.	5	8	33	13	18	3	21	38.49	29	17	10																										
In Apogee	-	-	27	4	0	Morning.	6	4	41	14	18	5	22	7	36	30	15	28																									

MARCH, 1867.

WEEK DAY.		MONTH DAY.		WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.	
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.			
				H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.	
F	1	2	8	26	9			2	48	27	2	6	19	11	11	6	54	12	2	7	6	8	6	7	41	8	8	24	7
S	2	3	26	28	0			4	2	29	0	7	27	12	6	7	56	12	11	8	15	8	11	8	46	9	2	25	7
M	3	4	34	30	2			5	1	31	5	8	20	13	5	8	41	13	10	9	13	9	5	9	37	9	8	26	7
Th	4	5	26	32	8			5	49	33	9	9	0	14	4	9	18	14	9	9	59	9	11	10	17	10	2	27	7
F	5	6	11	34	11			6	31	35	10	9	36	15	2	9	54	15	6	10	34	10	5	10	51	10	8	28	7
S	6	6	52	36	8			7	11	37	5	10	12	15	10	10	29	16	2	11	8	10	11	11	26	11	1		●
M	7	7	30	38	1			7	49	38	7	10	45	16	5	11	2	16	6	11	44	11	2	—	—			1	1
Th	8	8	7	38	10			8	26	38	11	11	18	16	7	11	37	16	7	0	2	11	3	0	21	11	3	2	1
F	9	8	44	38	9			9	2	38	6	11	58	16	6	—	—			0	41	11	3	1	1	11	2	3	1
S	10	9	20	38	11			9	39	37	5	0	18	16	4	0	39	16	1	1	21	11	0	1	41	10	10	4	1
M	11	9	58	36	6			10	16	35	6	1	2	15	10	1	26	15	5	2	3	10	8	2	26	10	5	5	1
Th	12	10	34	34	3			10	56	33	0	1	50	15	0	2	16	14	6	2	49	10	3	3	15	10	0	6	1
F	13	11	21	31	8			11	51	30	7	2	45	14	0	3	18	13	7	3	44	9	8	4	17	9	5		☽
S	14	—	—	—				0	29	29	9	3	55	13	3	4	38	13	0	4	53	9	2	5	33	9	0	8	1
M	15	1	12	29	6			1	59	29	7	5	26	13	0	6	10	13	2	6	15	9	0	6	57	9	2	9	1
Th	16	2	42	30	2			3	24	31	1	6	48	13	5	7	23	13	9	7	35	9	5	8	11	9	7	10	1
F	17	4	5	32	2			4	39	33	5	7	55	14	3	8	21	14	9	8	46	9	10	9	15	10	2	11	1
S	18	5	12	34	8			5	40	35	9	8	47	15	11	9	9	15	7	9	44	10	5	10	9	10	7	12	1
M	19	6	4	36	8			6	28	37	4	9	29	15	11	9	49	16	2	10	28	10	10	10	47	11	0	13	1
Th	20	6	50	37	10			7	10	38	2	10	9	16	5	10	27	16	6	11	5	11	2	11	23	11	3		○
F	21	7	28	38	5			7	47	38	6	10	43	16	6	11	0	16	6	11	41	11	11	12	0	11	2	15	1
S	22	8	5	38	3			8	22	37	10	11	17	16	4	11	33	16	2	—	—			0	19	11	1	16	1
M	23	8	37	37	5			8	53	36	10	11	51	15	11	—	—			0	37	11	0	0	54	10	10	17	1
Th	24	9	9	36	1			9	25	35	4	0	10	15	8	0	28	15	3	1	13	10	8	1	31	10	5	18	1
F	25	9	39	34	5			9	53	33	4	0	47	14	11	1	5	14	6	1	48	10	2	2	5	9	11	19	1
S	26	10	8	32	3			10	24	31	1	1	24	14	0	1	45	13	7	2	24	9	9	2	45	9	6	20	1
M	27	10	40	30	0			10	59	28	11	2	7	13	2	2	30	12	9	3	6	9	3	3	28	9	0	21	1
Th	28	11	25	27	11			11	58	27	1	2	54	12	5	3	27	12	1	3	53	8	10	4	25	8	7		☾
F	29	—	—	—				0	34	26	7	4	5	11	10	4	47	11	9	5	1	8	5	5	38	8	4	23	1
S	30	1	13	26	8			1	58	27	0	5	27	11	10	6	8	12	1	6	16	8	5	6	55	8	7	24	1
M	31	2	37	27	8			3	15	28	7	6	44	12	4	7	16	12	9	7	31	8	9	8	4	9	0	25	1
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.											

at Noon.

D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
17	8	36		25	6	11	
18	8	19		26	5	53	
19	8	1		27	5	34	
20	7	43		28	5	16	
21	7	25		29	4	57	
22	7	6		30	4	39	
23	6	48		31	4	21	
24	6	30					

The table of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

APRIL, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
M.	1	9m 17	1	8	14	6	1	34	15	3	2	33	12	11	3	5	12	9	8	59	10	7	9	26	11	0
Tu.	2	10 5	1	56	16	3	2	17	17	1	3	35	13	11	4	0	13	9	9	50	11	5	10	12	11	9
W.	3	10 54	2	36	17	9	2	54	18	7	4	25	14	9	4	47	14	8	10	31	12	1	10	50	12	0
Th.	4	11 45	3	13	19	3	3	33	19	8	5	9	15	6	5	29	15	5	11	9	12	9	11	29	12	1
F.	5	0a 37	3	52	20	0	4	12	20	3	5	49	16	1	6	11	15	11	11	48	13	2	—	—	—	—
S.	6	1 30	4	32	20	5	4	52	20	6	6	32	16	3	6	52	16	1	0	8	13	3	0	29	13	2
S.	7	2 26	5	12	20	4	5	33	20	1	7	10	16	2	7	29	15	11	0	51	13	3	1	12	13	3
M.	8	3 24	5	54	19	9	6	15	19	3	7	51	15	10	8	12	15	7	1	34	13	2	1	55	13	4
Tu.	9	4 23	6	38	18	7	7	2	17	9	8	34	15	3	8	56	15	0	2	16	12	9	2	39	12	5
W.	10	5 21	7	29	17	0	7	58	16	1	9	19	14	5	9	43	14	4	3	3	12	2	3	29	11	6
Th.	11	6 19	8	29	15	4	9	3	14	9	10	11	13	6	10	40	13	6	3	56	11	5	4	26	11	7
F.	12	7 14	9	42	14	5	10	27	14	4	11	14	12	9	11	52	13	0	4	59	10	8	5	36	10	8
S.	13	8 7	11	11	14	6	11	52	14	10	—	—	—	—	0	37	12	6	6	18	10	3	7	0	10	9
S.	14	8 57	—	—	—	—	0	29	15	3	1	20	13	2	2	0	12	10	7	40	10	7	8	18	10	1
M.	15	9 46	1	1	15	10	1	30	16	5	2	37	13	9	3	10	13	7	8	52	11	3	9	22	11	2
Tu.	16	10 33	1	55	17	1	2	18	17	9	3	37	14	6	4	4	14	4	9	49	11	10	10	13	12	3
W.	17	11 19	2	38	18	3	2	57	18	7	4	29	15	2	4	51	14	11	10	34	12	4	10	53	12	4
Th.	18	morn.	3	16	18	11	3	35	19	0	5	12	15	6	5	31	15	4	11	12	12	6	11	31	12	5
F.	19	0 5	3	53	19	1	4	11	19	0	5	50	15	8	6	9	15	5	11	49	12	8	—	—	—	—
S.	20	0 51	4	29	18	11	4	44	18	9	6	26	15	6	6	42	15	4	0	7	12	7	0	26	12	6
S.	21	1 38	5	0	18	6	5	17	18	3	6	57	15	2	7	11	14	11	0	43	12	5	1	0	12	7
M.	22	2 25	5	33	17	10	5	50	17	6	7	26	14	8	7	41	14	6	1	17	12	2	1	34	12	8
Tu.	23	3 12	6	7	17	0	6	24	16	6	7	56	14	0	8	12	13	10	1	50	11	10	2	7	11	9
W.	24	3 59	6	42	15	9	7	1	15	3	8	27	13	3	8	42	13	2	2	25	11	5	2	43	11	10
Th.	25	4 47	7	23	14	8	7	46	14	1	9	0	12	6	9	21	12	7	3	2	10	11	3	23	10	11
F.	26	5 34	8	11	13	7	8	39	13	3	9	43	11	9	10	9	12	1	3	45	10	5	4	8	10	12
S.	27	6 21	9	13	13	0	9	50	13	0	10	35	11	4	11	9	11	10	4	35	9	11	5	8	9	13
S.	28	7 8	10	31	13	2	11	9	13	6	11	48	11	4	—	—	—	—	5	43	9	8	6	21	9	14
M.	29	7 55	11	46	14	0	—	—	—	—	0	31	12	1	1	11	11	10	6	58	9	10	7	34	10	15
Tu.	30	8 43	0	20	14	7	0	49	15	3	1	50	12	10	2	25	12	9	8	9	10	7	8	39	10	16
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	
New - - - - -	4	10	4	Afternoon.	1	9	55	9	17	N. 55	17	28	33	25	17	4
First Quarter-	11	3	9	Afternoon.	2	6	13	10	18	14	18	6	26	26	16	10
Full - - - - -	18	11	6	Afternoon.	3	2	7	11	17	24	19	9	58	27	14	6
Last Quarter -	27	2	1	Morning.	4	2	N. 12	12	15	31	20	13	0	28	11	16
					5	6	30	13	12	46	21	15	26	29	7	
In Perigee - -	8	1	0	Morning.	6	10	30	14	9	22	22	17	11	30	3	
In Apogee - -	23	10	0	Afternoon.	7	13	54	15	5	32	23	18	9			
					8	16	27	16	1	30	24	18	19			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, —
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

APRIL, 1867.

[illegible]

APRIL, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9m17	9 23	9 11	9 51	10 2	3 44	16 9	4 13	17 6	0 35	11 2	1 3	11 8
Tu.	2	10 5	10 17	10 6	10 41	10 9	4 37	18 2	4 59	18 11	1 27	12 2	1 51	12 9
W.	3	10 54	11 1	11 1	11 20	11 4	5 18	19 6	5 37	20 0	2 13	13 1	2 32	13 7
Th.	4	11 45	11 40	11 7	11 59	11 9	5 56	20 7	6 15	21 0	2 52	14 0	3 10	14 4
F.	5	0a37	—	—	0 19	11 11	6 35	21 5	6 55	21 8	3 28	14 8	3 47	14 11
S.	6	1 30	0 36	12 0	0 56	12 1	7 15	21 11	7 36	22 1	4 6	15 2	4 26	15 3
♄.	7	2 26	1 17	12 1	1 38	12 0	7 57	22 1	8 17	22 0	4 46	15 3	5 6	15 2
M.	8	3 24	1 58	11 11	2 20	11 9	8 38	21 9	8 59	21 5	5 28	14 11	5 50	14 7
Tu.	9	4 23	2 41	11 7	3 3	11 5	9 21	20 11	9 44	20 3	6 12	14 3	6 37	13 10
W.	10	5 21	3 26	11 2	3 50	10 11	10 8	19 8	10 35	19 0	7 3	13 4	7 31	12 11
Th.	11	6 19	4 15	10 8	4 43	10 5	11 8	18 3	11 45	17 9	8 2	12 5	8 35	12 0
F.	12	7 14	5 15	10 2	5 49	10 0	—	—	0 26	17 2	9 12	11 8	9 53	11 5
S.	13	8 7	6 28	9 11	7 17	10 0	1 6	16 11	1 45	16 10	10 37	11 4	11 16	11 6
♄.	14	8 57	7 59	10 1	8 37	10 3	2 23	17 1	2 59	17 6	11 52	11 9	—	—
M.	15	9 46	9 13	10 5	9 44	10 8	3 34	18 1	4 6	18 8	0 25	12 1	0 56	12 6
Tu.	16	10 33	10 13	10 11	10 39	11 1	4 33	19 2	4 57	19 8	1 23	12 11	1 50	13 3
W.	17	11 19	11 2	11 4	11 23	11 6	5 19	20 0	5 39	20 4	2 14	13 7	2 35	13 10
Th.	18	morn.	11 43	11 7	—	—	5 58	20 6	6 18	20 8	2 54	14 0	3 13	14 2
F.	19	0 5	0 2	11 8	0 20	11 8	6 39	20 10	6 57	20 11	3 31	14 3	3 48	14 4
S.	20	0 51	0 37	11 8	0 55	11 7	7 14	20 10	7 33	20 9	4 6	14 4	4 23	14 4
♄.	21	1 38	1 14	11 6	1 30	11 4	7 49	20 7	8 5	20 5	4 38	14 3	4 54	14 0
M.	22	2 25	1 46	11 3	2 3	11 1	8 21	20 2	8 38	19 9	5 11	13 9	5 28	13 6
Tu.	23	3 12	2 20	10 11	2 37	10 9	8 55	19 5	9 13	18 11	5 46	13 2	6 4	12 10
W.	24	3 59	2 55	10 7	3 12	10 5	9 30	18 6	9 48	17 11	6 23	12 6	6 43	12 2
Th.	25	4 47	3 30	10 2	3 48	10 0	10 8	17 6	10 30	17 0	7 4	11 10	7 26	11 6
F.	26	5 34	4 9	9 10	4 31	9 8	10 57	16 6	11 27	16 2	7 50	11 2	8 17	10 11
S.	27	6 21	4 57	9 6	5 25	9 5	—	—	0 1	15 11	8 48	10 8	9 24	10 7
♄.	28	7 8	5 59	9 5	6 38	9 5	0 37	15 8	1 13	15 7	10 2	10 6	10 40	10 7
M.	29	7 55	7 21	9 6	7 57	9 8	1 48	15 9	2 21	16 2	11 14	10 10	11 47	11 3
Tu.	30	8 43	8 32	9 11	9 4	10 2	2 54	16 9	3 25	17 5	—	—	0 17	11 8

Half Mean Spring } 5ft. 9in.
Range }

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - -	4	10	4 Afternoon.	1	9	55	9	17	N. 55	17	2	33	25	17	41
First Quarter	11	3	9 Afternoon.	2	6	13	10	18	14	18	6	26	26	16	16
Full - - - -	18	11	6 Afternoon.	3	2	7	11	17	24	19	9	58	27	14	6
Last Quarter -	27	2	1 Morning.	4	2	N. 12	12	15	31	20	13	0	28	11	15
				5	6	30	13	12	46	21	15	26	29	7	49
In Perigee - -	8	1	0 Morning.	6	10	30	14	9	22	22	17	11	30	3	54
In Apogee - -	23	10	0 Afternoon.	7	13	54	15	5	32	23	18	9			
				8	16	27	16	1	30	24	18	19			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

APRIL, 1867.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C'S AGE AT NOON.	
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		
M.	1	0 49	10 2	1 15	10 6	—	—	0 9	13 2	6 11	9 10	6 34	10 5	26.1	
Tu.	2	1 38	11 0	1 58	11 6	0 32	13 8	0 52	14 4	6 52	11 1	7 9	11 9	27.1	
W.	3	2 17	11 11	2 36	12 5	1 12	14 11	1 31	15 5	7 25	12 4	7 41	12 11	28.1	
Th.	4	2 53	12 11	3 10	13 3	1 50	16 0	2 8	16 5	7 57	13 5	8 15	13 9	●	
F.	5	3 28	13 7	3 47	13 10	2 28	16 9	2 45	17 0	8 33	14 0	8 51	14 1	0.6	
S.	6	4 7	14 0	4 27	14 1	3 3	17 2	3 23	17 3	9 12	14 2	9 33	14 2	1.6	
S.	7	4 48	14 0	5 9	13 10	3 44	17 2	4 4	17 0	9 54	14 0	10 16	13 9	2.6	
M.	8	5 31	13 8	5 53	13 5	4 26	16 9	4 48	16 6	10 38	13 5	11 1	13 0	3.6	
Tu.	9	6 16	13 1	6 40	12 9	5 10	16 2	5 35	15 9	11 27	12 6	11 53	12 0	4.6	
W.	10	7 5	12 4	7 33	11 10	6 1	15 3	6 30	14 8	—	—	0 21	11 6	5.6	
Th.	11	8 6	11 3	8 42	10 9	7 1	14 1	7 37	13 8	0 53	11 0	1 27	10 7	6	
F.	12	9 22	10 6	10 6	10 4	8 16	13 3	8 58	13 0	2 7	10 2	2 50	9 11	7.6	
S.	13	10 49	10 4	11 29	10 6	9 44	13 0	10 22	13 2	3 40	9 10	4 22	9 11	8.6	
S.	14	—	—	0 6	10 9	10 59	13 4	11 32	13 8	5 0	10 1	5 34	10 4	9.6	
M.	15	0 39	11 1	1 8	11 4	—	—	0 2	14 1	6 4	10 9	6 28	11 3	10.6	
Tu.	16	1 33	11 8	1 56	12 0	0 27	14 6	0 50	14 11	6 50	11 9	7 9	12 3	11.6	
W.	17	2 18	12 4	2 38	12 8	1 13	15 4	1 34	15 9	7 26	12 8	7 43	12 11	12.6	
Th.	18	2 55	12 10	3 13	13 1	1 53	16 0	2 11	16 2	8 0	13 2	8 17	13 4	13.6	
F.	19	3 31	13 2	3 48	13 3	2 29	16 4	2 46	16 4	8 34	13 4	8 51	13 3	14.6	
S.	20	4 6	13 2	4 23	13 1	3 3	16 3	3 19	16 2	9 8	13 2	9 25	12 11	15.6	
S.	21	4 40	12 11	4 57	12 9	3 36	16 0	3 52	15 9	9 42	12 9	9 59	12 6	16.6	
M.	22	5 15	12 6	5 32	12 3	4 9	15 5	4 27	15 2	10 17	12 2	10 35	11 10	17.6	
Tu.	23	5 50	12 0	6 8	11 9	4 44	14 11	5 2	14 7	10 53	11 6	11 12	11 1	18.6	
W.	24	6 26	11 5	6 45	11 1	5 21	14 3	5 41	13 11	11 32	10 8	11 53	10 4	19.6	
Th.	25	7 5	10 9	7 29	10 5	6 2	13 6	6 25	13 1	—	—	0 17	9 11	20.6	
F.	26	7 55	10 0	8 24	9 8	6 50	12 9	7 19	12 5	0 41	9 7	1 9	9 4	21.6	
S.	27	8 57	9 6	9 36	9 5	7 51	12 3	8 28	12 1	1 42	9 2	2 20	9 0	22.6	
S.	28	10 14	9 5	10 52	9 7	9 7	12 0	9 47	12 2	3 0	8 11	3 44	9 0	23.6	
M.	29	11 27	9 11	—	—	10 21	12 5	10 54	12 9	4 20	9 3	4 55	9 6	24.6	
Tu.	30	0 1	10 3	0 31	10 7	11 24	13 3	11 50	13 8	5 26	9 10	5 52	10 4	25.6	
Half Mean Spring Range.				6ft. 8in.				8ft. 2in.				6ft. 7in.			

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	4	2	Sub.	9	1	42	Sub.	17	0	23	Add.	25	2	4	Add.
2	3	44		10	1	26		18	0	37		26	2	14	
3	3	26		11	1	9		19	0	50		27	2	24	
4	3	9		12	0	53		20	1	4		28	2	34	
5	2	51		13	0	38		21	1	17		29	2	43	
6	2	34		14	0	22		22	1	29		30	2	51	
7	2	16		15	0	7		23	1	41					
8	1	59		16	0	8		24	1	53					
							Add.								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 ROYAL OBSERVATORY add 6 m. LEITH add 1 m. THURSO add 14 m.

APRIL, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.
M.	1	9m17	9	21	8	6	9	47	8	8	8	47	21	3	9	11	22	2	3	15	16	4	3	43	17	
Tu.	2	10 5	10	11	8	11	10	32	9	1	9	32	23	1	9	52	23	11	4	9	18	1	4	52	18	
W.	3	10 54	10	52	9	3	11	13	9	6	10	10	24	8	10	28	25	5	4	55	19	8	5	17	20	
Th.	4	11 45	11	33	9	8	11	55	9	10	10	47	26	0	11	7	26	6	5	38	21	0	5	58	21	
F.	5	0a37	—	—	—	—	0	15	10	0	11	27	27	0	11	47	27	3	6	18	21	10	6	38	22	
S.	6	1 30	0	35	10	1	0	56	10	2	—	—	—	0	8	27	6	6	59	22	5	7	19	22		
S.	7	2 26	1	18	10	2	1	38	10	2	0	28	27	7	0	49	27	6	7	59	22	3	8	0	22	
M.	8	3 24	1	59	10	1	2	20	10	0	1	10	27	2	1	31	26	8	8	22	21	7	8	44	21	
Tu.	9	4 23	2	42	9	11	3	4	9	9	1	51	26	0	2	14	25	3	9	6	20	6	9	29	19	
W.	10	5 21	3	27	9	6	3	52	9	4	2	38	24	6	3	3	23	8	9	52	19	0	10	18	18	
Th.	11	6 19	4	20	9	1	4	50	8	11	3	31	22	9	4	3	21	11	10	45	17	6	11	13	16	
F.	12	7 14	5	24	8	8	6	2	8	6	4	40	21	3	5	22	20	10	11	47	16	3	—	—	—	
S.	13	8 7	6	44	8	5	7	25	8	5	6	10	20	9	6	55	21	0	0	25	16	1	1	8	16	
S.	14	8 57	8	4	8	6	8	41	8	8	7	33	21	6	8	10	22	1	1	53	16	6	2	35	17	
M.	15	9 46	9	14	8	10	9	43	9	0	8	40	22	9	9	7	23	5	3	9	17	8	3	39	18	
Tu.	16	10 33	10	10	9	2	10	33	9	4	9	30	24	1	9	53	24	8	4	9	19	0	4	35	19	
W.	17	11 19	10	55	9	5	11	16	9	6	10	12	25	1	10	31	25	5	4	58	20	1	5	20	20	
Th.	18	morn.	11	37	9	7	11	58	9	7	10	51	25	7	11	10	25	9	5	42	20	8	6	2	20	
F.	19	0 5	—	—	—	—	0	16	9	8	11	28	25	11	11	46	25	10	6	20	20	11	6	37	20	
S.	20	0 51	0	34	9	8	0	52	9	8	—	—	—	0	4	25	9	6	55	20	10	7	11	20		
S.	21	1 38	1	10	9	8	1	27	9	7	0	21	25	7	0	37	25	5	7	27	20	5	7	44	20	
M.	22	2 25	1	44	9	6	2	0	9	5	0	54	25	1	1	10	24	7	8	0	19	9	8	17	19	
Tu.	23	3 12	2	16	9	4	2	33	9	3	1	26	24	1	1	43	23	6	8	35	18	11	8	52	18	
W.	24	3 59	2	50	9	1	3	7	8	11	2	0	22	11	2	18	22	3	9	9	17	10	9	27	17	
Th.	25	4 47	3	25	8	9	3	46	8	8	2	36	21	8	2	57	21	1	9	46	16	9	10	6	16	
F.	26	5 34	4	8	8	6	4	32	8	4	3	19	20	6	3	45	19	11	10	27	15	9	10	51	15	
S.	27	6 21	5	0	8	3	5	33	8	1	4	16	19	6	4	52	19	3	11	20	14	11	11	53	14	
S.	28	7 8	6	9	8	0	6	47	8	0	5	31	19	2	6	14	19	5	—	—	—	0	28	14		
M.	29	7 55	7	24	8	1	7	59	8	3	6	53	19	11	7	28	20	6	1	6	15	2	1	47	15	
Tu.	30	8 48	8	32	8	6	9	1	8	8	8	1	21	3	8	28	22	1	2	24	16	4	2	55	17	

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
New	4	10	4	Afternoon.
First Quarter	11	3	9	Afternoon.
Full	18	11	6	Afternoon.
Last Quarter	27	2	1	Morning.
In Perigee	8	1	0	Morning.
In Apogee	23	10	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	9	55	9	17	N.55	17	28	33	25	17	41
2	6	13	10	18	14	18	6	26	26	16	
3	2	7	11	17	24	19	9	58	27	14	
4	2	N.12	12	15	31	20	13	0	28	11	
5	6	30	13	12	46	21	15	26	29	7	49
6	10	30	14	9	22	22	17	11	30	3	54
7	13	54	15	5	32	23	18	9			
8	16	27	16	1	30	24	18	19			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

APRIL, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D.
M.	1	3 49 29 8		4 20 30 11		7 43 13 2		8 7 13 9		8 33 9 3		8 59 9 7		26·1
Tu.	2	4 48 32 5		5 13 33 9		8 28 14 3		8 47 14 9		9 24 9 11		9 46 10 2		27·1
W.	3	5 36 34 11		5 58 36 2		9 5 15 3		9 23 15 8		10 5 10 5		10 22 10 9		28·1
Th.	4	6 19 37 1		6 40 37 10		9 42 16 1		10 1 16 5		10 38 11 0		10 56 11 2		●
F.	5	7 1 38 6		7 22 39 1		10 18 16 8		10 36 16 10		11 15 11 4		11 34 11 5		0·6
S.	6	7 42 39 6		8 2 39 6		10 55 16 11		11 14 16 11		11 55 11 5		— —		1·6
S.	7	8 22 39 5		8 42 39 1		11 34 16 10		11 57 16 8		0 16 11 5		0 38 11 4		2·6
M.	8	9 2 38 7		9 22 37 11		— —		0 20 16 4		1 0 11 3		1 22 11 0		3·6
Tu.	9	9 42 36 10		10 2 35 8		0 44 16 0		1 9 15 7		1 45 10 9		2 9 10 6		4·6
W.	10	10 23 34 5		10 46 33 1		1 35 15 1		2 3 14 7		2 35 10 3		3 2 10 0		5·6
Th.	11	11 12 31 10		11 44 30 8		2 34 14 1		3 8 13 7		3 33 9 9		4 7 9 6		6·6
F.	12	— —		0 22 29 11		3 48 13 3		4 31 13 0		4 46 9 3		5 26 9 1		7·6
S.	13	1 3 29 8		1 46 29 10		5 17 13 0		5 56 13 3		6 6 9 1		6 43 9 3		8·6
S.	14	2 26 30 3		3 6 31 0		6 33 13 6		7 6 13 9		7 19 9 5		7 54 9 7		9·6
M.	15	3 43 31 10		4 17 32 10		7 36 14 1		8 2 14 6		8 26 9 10		8 55 10 0		10·6
Tu.	16	4 48 33 11		5 16 34 10		8 26 14 10		8 48 15 3		9 23 10 3		9 47 10 5		11·6
W.	17	5 39 35 8		6 2 36 2		9 7 15 6		9 25 15 8		10 7 10 7		10 24 10 9		12·6
Th.	18	6 24 36 7		6 44 36 10		9 44 15 10		10 3 15 11		10 42 10 10		11 0 10 11		○
F.	19	7 3 37 0		7 21 37 1		10 19 16 0		10 35 16 0		11 17 11 0		11 34 10 11		14·6
S.	20	7 39 37 0		7 55 36 9		10 51 15 11		11 6 15 9		11 52 10 10		— —		15·6
S.	21	8 10 36 5		8 26 36 0		11 22 15 7		11 40 15 4		0 9 10 9		0 26 10 8		16·6
M.	22	8 42 35 6		8 57 34 11		11 58 15 1		— —		0 43 10 6		1 1 10 4		17·6
Tu.	23	9 13 34 3		9 28 33 5		0 16 14 10		0 35 14 6		1 19 10 2		1 36 9 11		18·6
W.	24	9 44 32 6		9 59 31 8		0 54 14 1		1 14 13 9		1 54 9 9		2 14 9 6		19·6
Th.	25	10 15 30 9		10 33 29 9		1 35 13 4		1 58 13 0		2 35 9 4		2 57 9 2		20·6
F.	26	10 54 28 11		11 20 28 4		2 22 12 8		2 50 12 5		3 21 9 0		3 49 8 10		21·6
S.	27	11 53 27 9		— —		3 23 12 3		4 1 12 1		4 21 8 8		4 57 8 7		☾
S.	28	0 29 27 5		1 7 27 7		4 40 12 1		5 20 12 3		5 33 8 6		6 9 8 8		23·6
M.	29	1 44 28 1		2 21 28 11		5 55 12 6		6 28 12 11		6 42 8 10		7 14 9 1		24·6
Tu.	30	2 56 29 10		3 29 30 11		6 58 13 3		7 24 13 9		7 45 9 4		8 14 9 7		25·6
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
1	4 2	Sub.	9	1 42	Sub.	17	0 23	Add.	25	2 4	Add.
2	3 44		10	1 26		18	0 37		26	2 14	
3	3 26		11	1 9		19	0 50		27	2 24	
4	3 9		12	0 53		20	1 4		28	2 34	
5	2 51		13	0 38		21	1 17		29	2 43	
6	2 34		14	0 22		22	1 29		30	2 51	
7	2 16		15	0 7		23	1 41				
8	1 59		16	0 8	Add.	24	1 53				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

APRIL, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9m 17	8 18	8 2	8 41	8 5	5 33	6 3	5 53	6 6	2 50	8 10	3 11	9 3
Tu.	2	10 5	9 2	8 9	9 22	9 0	6 12	6 10	6 32	7 1	3 32	9 8	3 49	10 4
W.	3	10 54	9 40	9 2	9 59	9 4	6 51	7 4	7 11	7 6	4 7	10 6	4 25	10 11
Th.	4	11 45	10 17	9 6	10 36	9 8	7 31	7 9	7 51	7 11	4 43	11 3	5 4	11 6
F.	5	0a37	10 54	9 9	11 13	9 9	8 9	8 1	8 27	8 2	5 24	11 9	5 43	11 10
S.	6	1 30	11 32	9 9	11 52	9 9	8 45	8 3	9 4	8 2	6 3	11 11	6 22	11 10
S.	7	2 26	—	—	0 13	9 9	9 23	8 1	9 43	7 11	6 43	11 9	7 5	11 6
M.	8	3 24	0 36	9 8	0 59	9 7	10 3	7 8	10 24	7 6	7 27	11 2	7 48	10 12
Tu.	9	4 23	1 23	9 6	1 48	9 4	10 47	7 3	11 14	6 11	8 11	10 6	8 36	10 1
W.	10	5 21	2 16	9 2	2 45	8 11	11 48	6 7	—	—	9 4	9 8	9 39	9 5
Th.	11	6 19	3 16	8 8	3 50	8 6	0 27	6 3	1 10	6 0	10 16	9 0	10 57	8 9
F.	12	7 14	4 27	8 4	5 7	8 3	1 57	5 11	2 43	5 10	11 39	8 8	—	—
S.	13	8 7	5 47	8 2	6 27	8 2	3 25	6 0	4 1	6 3	0 21	8 8	1 1	8 9
S.	14	8 57	7 5	8 3	7 40	8 4	4 32	6 6	5 0	6 8	1 38	8 11	2 13	9 1
M.	15	9 46	8 10	8 6	8 36	8 9	5 24	6 10	5 47	7 0	2 42	9 6	3 7	9 9
Tu.	16	10 33	9 0	9 0	9 23	9 2	6 10	7 2	6 33	7 4	3 30	10 1	3 50	10 5
W.	17	11 19	9 43	9 3	10 1	9 4	6 54	7 5	7 14	7 6	4 9	10 9	4 28	10 11
Th.	18	morn.	10 20	9 5	10 38	9 6	7 34	7 7	7 53	7 8	4 47	11 1	5 7	11 2
F.	19	0 5	10 55	9 6	11 13	9 5	8 10	7 9	8 26	7 9	5 25	11 3	5 43	11 9
S.	20	0 51	11 29	9 5	11 44	9 4	8 42	7 8	8 56	7 6	5 59	11 2	6 14	11 6
S.	21	1 38	—	—	0 1	9 3	9 12	7 5	9 28	7 3	6 31	10 10	6 49	10 7
M.	22	2 25	0 19	9 2	0 37	9 1	9 43	7 0	9 59	6 10	7 6	10 4	7 23	10 1
Tu.	23	3 12	0 55	9 0	1 13	8 11	10 16	6 8	10 34	6 6	7 40	9 9	7 57	9 9
W.	24	3 59	1 33	8 9	1 55	8 8	10 53	6 3	11 17	6 0	8 16	9 1	8 36	8 10
Th.	25	4 47	2 17	8 6	2 40	8 4	11 45	5 9	—	—	9 0	8 7	9 28	8 8
F.	26	5 34	3 4	8 2	3 32	8 1	0 17	5 6	0 51	5 4	9 58	8 1	10 32	8 6
S.	27	6 21	4 3	8 0	4 38	7 11	1 29	5 3	2 13	5 3	11 10	7 11	11 47	8 6
S.	28	7 8	5 14	7 11	5 50	7 11	2 51	5 4	3 28	5 7	—	—	0 24	8 1
M.	29	7 55	6 25	7 11	7 0	8 0	3 59	5 10	4 28	6 1	0 59	8 3	1 33	8 6
T.	30	8 43	7 32	8 2	7 59	8 5	4 53	6 4	5 14	6 7	2 4	8 10	2 31	9 2
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			

Phases of the Moon.

	D.	H.	M.	
New	4	10	4	Afternoon.
First Quarter	11	3	9	Afternoon.
Full	18	11	6	Afternoon.
Last Quarter	27	2	1	Morning.
In Perigee	8	1	0	Morning.
In Apogee	23	10	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	9	55	9	17	N.55	17	2	S.33	25	17	41
2	6	13	10	18	14	18	6	26	26	16	16
3	2	7	11	17	24	19	9	58	27	14	6
4	2	N.12	12	15	31	20	13	0	28	11	16
5	6	30	13	12	46	21	15	26	29	7	49
6	10	30	14	9	22	22	17	11	30	3	54
7	13	54	15	5	32	23	18	9	31		
8	16	27	16	1	30	24	18	19			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

BRITISH AND IRISH PORTS.

APRIL, 1867.

W. DAY.		M. DAY.		GALWAY.				QUEENSTOWN.				WATERFORD.				C's Acc.
				MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	
1 2 11 6	2 24 12	1 2 11 9	2 39 9	1 2 20 10	2 50 10	1 2 11 9	2 39 9	1 2 20 10	2 50 10	1 2 11 9	2 39 9	1 2 20 10	2 50 10	1 2 11 9	2 50 10	
2 46 12	3 8 13	3 3 10	3 26 10	3 18 11	3 42 11	3 3 10	3 26 10	3 18 11	3 42 11	3 3 10	3 26 10	3 18 11	3 42 11	3 3 10	3 42 11	
3 27 13	3 45 14	3 47 11	4 7 11	4 5 11	4 27 12	4 47 11	4 7 11	4 5 11	4 27 12	4 47 11	4 7 11	4 5 11	4 27 12	4 47 11	4 27 12	
4 41 14	4 23 15	4 27 11	4 47 12	4 49 12	5 10 12	4 27 11	4 47 12	4 49 12	5 10 12	4 27 11	4 47 12	4 49 12	5 10 12	4 47 11	5 10 12	
5 22 15	5 15 15	5 7 12	5 28 12	5 29 12	5 48 13	5 7 12	5 28 12	5 29 12	5 48 13	5 7 12	5 28 12	5 29 12	5 48 13	5 7 12	5 48 13	
6 41 15	5 43 15	5 49 12	6 10 12	6 9 13	6 30 13	5 49 12	6 10 12	6 9 13	6 30 13	5 49 12	6 10 12	6 9 13	6 30 13	5 49 12	6 30 13	
7 34 14	6 26 15	6 31 12	6 52 12	6 51 13	7 13 13	6 31 12	6 52 12	6 51 13	7 13 13	6 31 12	6 52 12	6 51 13	7 13 13	6 31 12	7 13 13	
8 27 13	7 10 14	7 13 12	7 34 11	7 34 12	7 55 12	7 13 12	7 34 11	7 34 12	7 55 12	7 13 12	7 34 11	7 34 12	7 55 12	7 13 12	7 55 12	
9 11 11	8 0 13	7 56 11	8 19 11	8 16 12	8 38 12	7 56 11	8 19 11	8 16 12	8 38 12	7 56 11	8 19 11	8 16 12	8 38 12	7 56 11	8 38 12	
10 0 10	8 58 12	8 42 10	9 9 10	9 0 11	9 24 11	8 42 10	9 9 10	9 0 11	9 24 11	8 42 10	9 9 10	9 0 11	9 24 11	8 42 10	9 24 11	
11 0 9	6 11 11	9 37 10	10 8 9	9 53 11	10 29 10	9 37 10	10 8 9	9 53 11	10 29 10	9 37 10	10 8 9	9 53 11	10 29 10	9 37 10	10 29 10	
12 0 8	4 32 11	10 46 9	11 29 9	11 8 10	11 47 10	11 29 9	11 29 9	11 8 10	11 47 10	11 29 9	11 29 9	11 8 10	11 47 10	11 29 9	11 47 10	
1 0 7	0 13 11	—	0 11 9	—	0 24 10	—	0 11 9	—	0 24 10	—	0 11 9	—	0 24 10	—	0 24 10	
2 0 6	1 24 12	0 51 9	1 30 9	1 1 10	1 38 10	0 51 9	1 30 9	1 1 10	1 38 10	0 51 9	1 30 9	1 1 10	1 38 10	0 51 9	1 38 10	
3 0 5	2 19 12	1 5 10	2 35 10	2 14 10	2 47 11	1 5 10	2 35 10	2 14 10	2 47 11	1 5 10	2 35 10	2 14 10	2 47 11	1 5 10	2 47 11	
4 0 4	3 9 13	2 3 10	3 27 11	3 18 11	3 45 11	2 3 10	3 27 11	3 18 11	3 45 11	2 3 10	3 27 11	3 18 11	3 45 11	2 3 10	3 45 11	
5 0 3	3 48 14	3 49 11	4 10 11	4 8 12	4 31 12	3 49 11	4 10 11	4 8 12	4 31 12	3 49 11	4 10 11	4 8 12	4 31 12	3 49 11	4 31 12	
6 0 2	4 26 14	4 30 11	4 49 11	4 53 12	5 13 12	4 30 11	4 49 11	4 53 12	5 13 12	4 30 11	4 49 11	4 53 12	5 13 12	4 30 11	5 13 12	
7 0 1	5 0 14	5 8 11	5 27 11	5 30 12	5 47 12	5 8 11	5 27 11	5 30 12	5 47 12	5 8 11	5 27 11	5 30 12	5 47 12	5 8 11	5 47 12	
8 0 0	5 35 14	5 45 11	6 2 11	6 5 12	6 22 12	5 45 11	6 2 11	6 5 12	6 22 12	5 45 11	6 2 11	6 5 12	6 22 12	5 45 11	6 22 12	
9 0 0	6 9 14	6 18 11	6 35 11	6 39 12	6 57 12	6 18 11	6 35 11	6 39 12	6 57 12	6 18 11	6 35 11	6 39 12	6 57 12	6 18 11	6 57 12	
10 0 0	6 44 13	6 52 11	7 9 10	7 13 11	7 29 11	6 52 11	7 9 10	7 13 11	7 29 11	6 52 11	7 9 10	7 13 11	7 29 11	6 52 11	7 29 11	
11 0 0	7 19 12	7 26 10	7 43 10	7 46 11	8 2 11	7 26 10	7 43 10	7 46 11	8 2 11	7 26 10	7 43 10	7 46 11	8 2 11	7 26 10	8 2 11	
12 0 0	8 0 11	8 0 10	8 18 9	8 18 11	8 35 10	8 0 10	8 18 9	8 18 11	8 35 10	8 0 10	8 18 9	8 18 11	8 35 10	8 0 10	8 35 10	
1 0 0	8 46 11	8 36 9	8 57 9	8 53 10	9 12 10	8 36 9	8 57 9	8 53 10	9 12 10	8 36 9	8 57 9	8 53 10	9 12 10	8 36 9	9 12 10	
2 0 0	9 42 10	9 19 9	9 45 8	9 35 10	10 5 9	9 19 9	9 45 8	9 35 10	10 5 9	9 19 9	9 45 8	9 35 10	10 5 9	9 19 9	10 5 9	
3 0 0	10 55 10	10 17 8	10 54 8	10 40 9	11 15 9	10 17 8	10 54 8	10 40 9	11 15 9	10 17 8	10 54 8	10 40 9	11 15 9	10 17 8	11 15 9	
4 0 0	—	11 33 8	—	11 50 9	—	11 33 8	—	11 50 9	—	11 33 8	—	11 50 9	—	11 33 8	—	
5 0 0	0 45 11	0 9 8	0 45 9	0 22 9	0 56 9	0 9 8	0 45 9	0 22 9	0 56 9	0 9 8	0 45 9	0 22 9	0 56 9	0 9 8	0 56 9	
6 0 0	1 42 12	1 20 9	1 51 9	1 29 10	2 0 10	1 20 9	1 51 9	1 29 10	2 0 10	1 20 9	1 51 9	1 29 10	2 0 10	1 20 9	2 0 10	
7th 5in.				5th 10in.				6th 2in.								
Equation of Time at Noon.																

Equation of Time at Noon.

M.	S.	Sub.	M.	S.	Add.	M.	S.	Add.
1	42		17	0	23	25	2	4
1	26		18	0	37	26	2	14
1	9		19	0	50	27	2	24
0	53		20	1	4	28	2	34
0	38		21	1	17	29	2	43
0	22		22	1	29	30	2	51
0	7		23	1	41			
0	8	Add.	24	1	53			

rem for Mean Time at Place; if Dublin or Railway Time be required,—
 QUEENSTOWN add 8 m. WATERFORD add 3 m.

MAY, 1867.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.	
W.	1	8 29 16 5	8 54 17 1	10 25 14 3	10 48 14 9	11 54 16 9	— — — —	26.6						
Th	2	9 18 17 7	9 41 18 2	11 10 15 2	11 32 15 6	0 19 17 2	0 42 17 8	27.6						
F.	3	10 4 18 8	10 28 19 1	11 54 15 10	— — — —	1 4 18 1	1 26 18 6	28.6						
S.	4	10 51 19 5	11 15 19 8	0 15 16 2	0 37 16 6	1 46 19 0	2 7 19 4	●						
M.	5	11 39 19 9	— — — —	0 58 16 9	1 19 16 11	2 28 19 8	2 49 19 11	1.2						
Tu.	6	0 3 19 10	0 28 19 9	1 41 16 11	2 3 16 10	3 10 20 0	3 32 20 1	2.2						
W.	7	0 53 19 7	1 18 19 4	2 25 16 9	2 47 16 8	3 54 20 0	4 16 19 10	3.2						
Th	8	1 43 19 1	2 9 18 8	3 9 16 5	3 32 16 1	4 40 19 8	5 4 19 4	4.2						
F.	9	2 36 18 1	3 4 17 5	3 58 15 9	4 25 15 4	5 30 19 0	5 55 18 7	5.2						
S.	10	3 22 16 11	4 0 16 4	4 53 14 10	5 25 14 6	6 21 18 1	6 53 17 7	D						
M.	11	4 29 15 10	4 59 15 4	5 57 14 1	6 31 13 10	7 25 17 3	7 58 16 11	7.2						
Tu.	12	5 31 15 2	6 4 15 1	7 9 13 7	7 50 13 7	8 36 16 7	9 14 16 6	8.2						
W.	13	6 38 15 3	7 14 15 8	8 28 13 8	9 2 13 10	9 52 16 5	10 27 16 6	9.2						
Th	14	7 45 16 0	8 15 16 4	9 38 14 2	10 7 14 4	11 5 16 8	11 37 16 10	10.2						
F.	15	8 41 16 7	9 6 16 11	10 34 14 7	10 59 14 10	— — — —	0 4 17 1	11.2						
S.	16	9 29 17 2	9 51 17 5	11 22 15 0	11 44 15 3	0 29 17 4	0 50 17 7	12.2						
M.	17	10 12 17 8	10 34 17 9	— — — —	0 3 15 4	1 14 17 10	1 36 18 0	13.2						
Tu.	18	10 54 17 10	11 15 17 11	0 23 15 6	0 43 15 7	1 54 18 2	2 13 18 4	○						
W.	19	11 33 17 10	11 52 17 9	1 2 15 8	1 19 15 8	2 30 18 5	2 47 18 6	15.2						
Th	20	— — — —	0 10 17 8	1 36 15 7	1 53 15 6	3 5 18 6	3 23 18 6	16.2						
F.	21	0 28 17 7	0 46 17 5	2 9 15 5	2 25 15 3	3 39 18 5	3 56 18 4	17.2						
S.	22	1 5 17 3	1 24 17 0	2 41 15 2	2 57 15 0	4 12 18 3	4 28 18 1	18.2						
M.	23	1 42 16 10	2 1 16 8	3 14 14 9	3 32 14 7	4 46 17 10	5 3 17 8	19.2						
Tu.	24	2 20 16 4	2 41 16 0	3 50 14 4	4 8 14 2	5 22 17 6	5 40 17 3	20.2						
W.	25	3 2 15 9	3 25 15 5	4 30 13 11	4 53 13 8	6 1 17 0	6 24 16 9	21.2						
Th	26	3 49 15 2	4 14 14 11	5 18 13 5	5 44 13 4	6 47 16 6	7 12 16 4	⊂						
F.	27	4 40 14 8	5 9 14 7	6 14 13 2	6 46 13 0	7 42 16 2	8 12 16 0	23.2						
S.	28	5 39 14 8	6 9 14 10	7 22 13 1	7 59 13 3	8 48 16 0	9 26 16 1	24.2						
M.	29	6 40 15 3	7 14 15 9	8 34 13 6	9 5 13 10	9 59 16 2	10 30 16 5	25.2						
Tu.	30	7 45 16 3	8 13 16 10	9 37 14 3	10 6 14 7	11 2 16 9	11 33 17 1	26.2						
W.	31	8 40 17 4	9 7 17 10	10 32 15 0	10 57 15 4	12 0 17 5	— — — —	27.2						

Half Mean Spring } 9ft. 4in. 8ft. 0in. 9ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	2	59	Add.	9	3	42	Add.	17	3	50	Add.	25	3	22	Add.
2	3	6		10	8	45		18	3	48		26	3	16	
3	3	13		11	3	47		19	3	46		27	3	10	
4	3	19		12	3	49		20	3	44	.	28	3	3	
5	3	25		13	3	50		21	3	41		29	2	56	
6	3	30		14	3	51		22	3	37		30	2	48	
7	3	35		15	3	51		23	3	32		31	2	40	
8	3	39		16	3	51		24	3	28					

the times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for SHEERNESS subtract 3 m. LONDON 0 m.

MAY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	9m32	9	32	10	5	9	57	10	9	3	53	18	2	4	17	18	10	0	44	12	2	1	8	12	8
Th.	2	10 23	10	22	11	0	10	44	11	4	4	40	19	6	5	1	20	0	1	32	13	1	1	56	13	6
F.	3	11 16	11	6	11	7	11	28	11	9	5	23	20	6	5	44	21	0	2	19	13	11	2	40	14	4
S.	4	0a12	11	50	11	11	—	—	—	—	6	6	21	5	6	28	21	8	3	1	14	8	3	21	14	11
S.	5	1 11	0	11	12	0	0	32	12	1	6	50	22	0	7	13	22	1	3	42	15	2	4	4	15	3
M.	6	2 11	0	54	12	1	1	17	12	1	7	36	22	1	7	58	22	0	4	26	15	4	4	48	15	2
Tu.	7	3 12	1	39	11	11	2	2	11	10	8	20	21	9	8	44	21	6	5	10	14	11	5	34	14	8
W.	8	4 12	2	26	11	8	2	50	11	5	9	8	20	11	9	34	20	5	5	59	14	3	6	26	13	11
Th.	9	5 9	3	16	11	3	3	42	11	0	10	1	19	9	10	29	19	1	6	55	13	5	7	25	13	0
F.	10	6 4	4	9	10	9	4	38	10	6	11	2	18	6	11	38	18	0	7	57	12	6	8	29	12	2
S.	11	6 55	5	9	10	3	5	41	10	2	—	—	—	—	0	16	17	6	9	3	11	10	9	40	11	8
S.	12	7 44	6	15	10	1	6	57	10	1	0	53	17	2	1	28	17	1	10	19	11	7	10	55	11	7
M.	13	8 31	7	36	10	1	8	11	10	2	2	2	17	2	2	34	17	5	11	27	11	8	11	58	12	0
Tu.	14	9 17	8	45	10	4	9	14	10	6	3	6	17	10	3	35	18	3	—	—	—	—	0	26	12	3
W.	15	10 2	9	42	10	8	10	9	10	10	4	3	18	8	4	29	19	0	0	53	12	6	1	19	12	9
Th.	16	10 48	10	33	11	0	10	55	11	1	4	51	19	4	5	12	19	7	1	44	13	0	2	7	13	3
F.	17	11 34	11	16	11	3	11	36	11	4	5	32	19	9	5	52	19	11	2	28	13	4	2	48	13	6
S.	18	morn.	11	56	11	4	—	—	—	—	6	13	20	0	6	33	20	0	3	7	13	7	3	25	13	8
S.	19	0 20	0	15	11	4	0	32	11	3	6	50	20	1	7	8	20	0	3	42	13	9	3	59	13	9
M.	20	1 7	0	49	11	3	1	7	11	2	7	26	19	11	7	43	19	10	4	16	13	9	4	32	13	8
Tu.	21	1 55	1	24	11	1	1	40	10	11	7	58	19	8	8	14	19	5	4	48	13	6	5	5	13	4
W.	22	2 42	1	56	10	10	2	14	10	8	8	31	19	3	8	49	18	11	5	22	13	1	5	40	12	10
Th.	23	3 29	2	32	10	7	2	50	10	5	9	7	18	7	9	26	18	3	5	58	12	7	6	17	12	4
F.	24	4 16	3	8	10	4	3	26	10	2	9	45	17	11	10	5	17	6	6	38	12	1	7	1	11	10
S.	25	5 2	3	46	10	0	4	7	9	11	10	28	17	3	10	56	16	11	7	25	11	8	7	50	11	5
S.	26	5 48	4	31	9	10	4	57	9	9	11	26	16	8	11	58	16	6	8	16	11	3	8	46	11	1
M.	27	6 35	5	25	9	8	5	54	9	8	—	—	—	—	0	31	16	4	9	18	11	0	9	53	11	4
Tu.	28	7 22	6	28	9	9	7	7	9	10	1	4	16	4	1	37	16	6	10	28	11	2	11	0	11	4
W.	29	8 10	7	42	10	0	8	13	10	2	2	7	16	10	2	35	17	4	11	29	11	8	11	58	12	1
Th.	30	9 1	8	45	10	5	9	13	10	8	3	5	18	0	3	35	18	7	—	—	—	—	0	25	12	6
F.	31	9 55	9	41	10	11	10	8	11	2	4	2	19	3	4	27	19	9	0	51	12	11	1	17	13	4
Half Mean Spring Range			5ft. 9in.								10ft. 5in.								7ft. 2in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'			
New - - - - - 4 7 40 Morning.												1	0	N.20	9	16	N.15	17	12	S.14	25	12	S.27			
First Quarter 10 10 4 Afternoon.												2	4	42	10	13	39	18	14	52	26	9	15			
Full - - - - - 18 1 52 Afternoon.												3	8	55	11	10	21	19	16	51	27	5	34			
Last Quarter - 26 5 22 Afternoon.												4	12	42	12	6	34	20	18	4	28	1	1			
												5	15	42	13	2	34	21	18	30	29	2	S.4			
												6	17	40	14	1	S.29	22	18	8	30	7	—			
In Perigee - - 5 11 0 Afternoon.												7	18	25	15	5	24	23	16	58	31	11	—			
In Apogee - - 21 11 0 Morning.												8	17	54	16	9	2	24	15	2						

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MAY, 1867.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	
W.	1	0 56	11 0	1 18	11 5	—	—	0 12	14 2	6 14	10 11	6 34	11 7	26.6
Th.	2	1 39	11 11	2 0	12 4	0 33	14 9	0 55	15 4	6 53	12 2	7 12	12 9	27.6
F.	3	2 21	12 10	2 41	13 2	1 17	15 10	1 38	16 4	7 29	13 3	7 48	13 9	28.6
S.	4	3 1	13 7	3 21	13 10	1 59	16 9	2 20	17 0	8 8	14 0	8 28	14 2	●
S.	5	3 42	14 0	4 4	14 1	2 40	17 3	3 1	17 3	8 49	14 3	9 11	14 2	1.2
M.	6	4 27	14 1	4 50	13 11	3 22	17 3	3 45	17 0	9 34	14 0	9 58	13 9	2.2
Tu.	7	5 14	13 8	5 38	13 5	4 8	16 9	4 32	16 6	10 23	13 6	10 48	13 1	3.2
W.	8	6 3	13 2	6 29	12 10	4 57	16 2	5 24	15 10	11 16	12 8	11 45	12 1	4.2
Th.	9	6 57	12 4	7 27	11 11	5 53	15 4	6 24	14 9	—	—	0 15	11 7	5.2
F.	10	8 1	11 5	8 35	10 11	6 56	14 3	7 31	13 10	0 48	11 1	1 21	10 9)
S.	11	9 12	10 8	9 53	10 6	8 6	13 6	8 45	13 3	1 57	10 5	2 37	10 2	7.2
S.	12	10 31	10 6	11 7	10 7	9 25	13 2	10 2	13 3	3 19	10 1	4 0	10 1	8.2
M.	13	11 40	10 9	—	—	10 34	13 4	11 5	13 7	4 33	10 1	5 7	10 3	9.2
Tu.	14	0 12	11 0	0 39	11 2	11 33	13 10	11 59	14 1	5 35	10 6	6 1	10 10	10.2
W.	15	1 5	11 4	1 29	11 7	—	—	0 23	14 4	6 24	11 2	6 44	11 6	11.2
Th.	16	1 50	11 10	2 11	12 0	0 45	14 8	1 6	15 0	7 3	11 10	7 19	12 1	12.2
F.	17	2 30	12 3	2 49	12 5	1 26	15 3	1 46	15 5	7 36	12 5	7 54	12 7	13.2
S.	18	3 7	12 6	3 25	12 7	2 5	15 7	2 24	15 8	8 12	12 8	8 29	12 8	○
S.	19	3 43	12 8	4 0	12 8	2 41	15 9	2 57	15 8	8 45	12 7	9 2	12 6	15.2
M.	20	4 17	12 7	4 34	12 5	3 13	15 6	3 29	15 5	9 18	12 4	9 35	12 2	16.2
Tu.	21	4 51	12 3	5 8	12 0	3 45	15 2	4 2	15 0	9 52	12 0	10 10	11 9	17.2
W.	22	5 26	11 10	5 44	11 7	4 20	14 9	4 38	14 6	10 28	11 5	10 47	11 2	18.2
Th.	23	6 2	11 5	6 21	11 3	4 56	14 4	5 15	14 1	11 7	10 11	11 28	10 8	19.2
F.	24	6 40	11 1	7 2	10 10	5 36	13 11	5 59	13 7	11 51	10 5	—	—	20.2
S.	25	7 27	10 7	7 54	10 3	6 23	13 3	6 49	13 0	0 15	10 2	0 41	9 11	21.2
S.	26	8 23	10 1	8 55	9 11	7 18	12 10	7 49	12 8	1 8	9 9	1 40	9 7	22.2
M.	27	9 28	9 10	10 5	9 11	8 22	12 7	8 58	12 7	2 13	9 6	2 50	9 6	23.2
Tu.	28	10 40	10 1	11 12	10 4	9 34	12 9	10 6	13 0	3 30	9 8	4 5	9 10	24.2
W.	29	11 42	10 9	—	—	10 35	13 4	11 4	13 8	4 35	10 1	5 7	10 4	25.2
Th.	30	0 11	11 1	0 38	11 5	11 32	14 1	11 57	14 6	5 34	10 9	5 59	11 3	26.2
F.	31	1 3	11 9	1 26	12 1	—	—	0 21	15 0	6 21	11 9	6 43	12 4	27.2

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	2	59	Add.	9	3	42	Add.	17	3	50	Add.	25	3	22	Add.
2	3	6		10	3	45		18	3	48		26	3	16	
3	3	13		11	3	47		19	3	46		27	3	10	
4	3	19		12	3	49		20	3	44		28	3	3	
5	3	25		13	3	50		21	3	41		29	2	56	
6	3	30		14	3	51		22	3	37		30	2	48	
7	3	35		15	3	51		23	3	32		31	2	40	
8	3	39		16	3	51		24	3	28					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
North Shields add 6 m. / LEITH add 1 m. / THURSO add 14 m.

MAY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
W.	1	9m32	9 27	8 11	9 52	9 2	8 51	23 0	9 13	23 10	3 23	17 11	3 50	18 9	
Th.	2	10 23	10 15	9 4	10 38	9 6	9 34	24 8	9 56	25 4	4 15	19 6	4 41	20 3	
F.	3	11 16	11 1	9 8	11 25	9 10	10 17	26 0	10 39	26 6	5 5	20 10	5 29	21 5	
S.	4	0 12	11 48	9 11	—	—	11 0	26 11	11 22	27 4	5 52	21 10	6 14	22 2	
♄.	5	1 11	0 10	10 1	0 33	10 2	11 45	27 6	—	—	6 36	22 5	6 58	22 5	
M.	6	2 11	0 56	10 2	1 20	10 2	0 7	27 7	0 30	27 6	7 20	22 8	7 43	22 0	
Tu.	7	3 12	1 43	10 1	2 6	10 0	0 53	27 2	1 16	26 9	8 6	21 8	8 30	21 2	
W.	8	4 12	2 29	9 11	2 54	9 9	1 39	26 1	2 4	25 5	8 56	20 8	9 22	19 10	
Th.	9	5 9	3 20	9 6	3 46	9 4	2 30	24 7	2 57	23 9	9 47	19 2	10 13	18 6	
F.	10	6 4	4 15	9 2	4 45	9 0	3 26	23 0	3 57	22 3	10 39	17 10	11 6	17 2	
S.	11	6 55	5 16	8 10	5 49	8 8	4 31	21 7	5 9	21 2	11 35	16 8	—	—	
♄.	12	7 44	6 26	8 6	7 2	8 5	5 51	21 1	6 31	21 2	0 8	16 6	0 44	16 4	
M.	13	8 31	7 37	8 6	8 13	8 7	7 6	21 5	7 40	21 10	1 22	16 6	2 2	16 10	
Tu.	14	9 17	8 43	8 9	9 12	8 11	8 11	22 4	8 37	22 9	2 35	17 3	3 7	17 9	
W.	15	10 2	9 39	9 0	10 4	9 1	9 2	23 3	9 25	23 8	3 36	18 8	4 3	18 8	
Th.	16	10 48	10 26	9 2	10 48	9 2	9 46	24 1	10 4	24 4	4 28	19 0	4 51	19 4	
F.	17	11 34	11 9	9 3	11 31	9 4	10 24	24 7	10 45	24 8	5 13	19 7	5 35	19 9	
S.	18	morn.	11 52	9 4	—	—	11 4	24 9	11 22	24 11	5 56	19 11	6 14	20 0	
♄.	19	0 20	0 10	9 4	0 28	9 5	11 40	24 10	11 58	24 9	6 31	20 0	6 49	19 11	
M.	20	1 7	0 46	9 5	1 3	9 4	—	—	0 15	24 8	7 4	19 10	7 20	19 7	
Tu.	21	1 55	1 20	9 4	1 37	9 3	0 31	24 6	0 47	24 2	7 37	19 4	7 54	19 1	
W.	22	2 42	1 53	9 3	2 10	9 2	1 4	23 10	1 21	23 5	8 12	18 9	8 30	18 6	
Th.	23	3 29	2 28	9 1	2 46	9 0	1 38	23 0	1 56	22 8	8 47	18 2	9 5	17 10	
F.	24	4 16	3 3	8 11	3 23	8 10	2 14	22 3	2 33	21 10	9 24	17 4	9 44	17 0	
S.	25	5 2	3 44	8 9	4 8	8 8	2 55	21 5	3 19	21 0	10 6	16 8	10 29	16 4	
♄.	26	5 48	4 33	8 7	5 0	8 6	3 44	20 8	4 14	20 4	10 53	16 0	11 17	15 8	
M.	27	6 35	5 28	8 5	6 0	8 4	4 45	20 1	5 22	20 2	11 45	15 8	—	—	
Tu.	28	7 22	6 35	8 3	7 8	8 4	6 0	20 4	6 37	20 9	0 17	15 9	0 50	16 0	
W.	29	8 10	7 39	8 6	8 12	8 8	7 9	21 4	7 41	22 0	1 25	16 5	2 3	17 0	
Th.	30	9 1	8 42	8 10	9 10	9 1	8 10	22 9	8 35	23 6	2 35	17 8	3 6	18 4	
F.	31	9 55	9 37	9 3	10 4	9 5	9 0	24 3	9 24	24 11	3 35	19 1	4 4	19 9	
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
New	—	—	4	7	40	Morning.	1	0	N. 20	9	16	N. 15	17	12	S. 14
First Quarter	10	10	4	—	—	Afternoon.	2	4	42	10	13	39	18	14	52
Full	18	1	52	—	—	Afternoon.	3	8	55	11	10	21	19	16	51
Last Quarter	26	5	22	—	—	Afternoon.	4	12	42	12	6	34	20	18	4
—							5	15	42	13	2	34	21	18	30
In Perigee							6	17	40	14	18	29	22	18	8
In Apogee							7	18	25	15	5	24	23	16	58
							8	17	54	16	9	2	24	15	2

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19m. LIVERPOOL add 12 m. PEMBROKE add 2m.

MAY, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				D.
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
W.	1	4	0	32	2	4	28	33	6	7	47	14	3	8	9	14	9	8	40	9	10	9	5	10	1	26.6
Th.	2	4	55	34	9	5	23	35	11	8	30	15	2	8	51	15	8	9	28	10	5	9	50	10	8	27.6
F.	3	5	40	37	0	6	10	37	11	9	11	16	0	9	32	16	5	10	10	10	11	10	30	11	2	28.6
S.	4	6	34	38	6	6	57	39	0	9	53	16	8	10	13	16	10	10	50	11	4	11	10	11	5	●
M.	5	7	20	39	5	7	42	39	7	10	33	16	11	10	54	16	11	11	32	11	6	11	55	11	5	1.2
Tu.	6	8	4	39	5	8	26	39	11	11	16	16	10	11	39	16	8	—	—	—	—	0	18	11	4	2.2
W.	7	8	48	38	8	9	10	37	11	—	—	—	—	0	4	16	5	0	42	11	3	1	7	11	1	3.2
Th.	8	9	33	37	1	9	56	35	10	0	30	16	1	0	58	15	8	1	32	10	10	1	58	10	7	4.2
F.	9	10	18	34	8	10	42	33	5	1	27	15	1	1	57	14	8	2	26	10	4	2	56	10	0	5.2
S.	10	11	8	32	4	11	36	31	4	2	29	14	2	3	2	13	10	3	28	9	10	4	0	9	7	6.2
M.	11	—	—	—	—	0	9	30	6	3	38	13	6	4	18	13	3	4	36	9	4	5	13	9	2	7.2
Tu.	12	0	45	30	2	1	22	30	1	4	58	13	3	5	35	13	4	5	49	9	2	6	23	9	3	8.2
W.	13	1	58	30	3	2	35	30	9	6	7	13	5	6	39	13	8	6	55	9	4	7	26	9	6	9.2
Th.	14	3	9	31	3	3	43	31	11	7	7	13	11	7	33	14	2	7	55	9	8	8	24	9	10	10.2
F.	15	4	14	32	7	4	43	33	4	7	58	14	5	8	20	14	8	8	51	9	11	9	17	10	1	11.2
S.	16	5	9	34	0	5	32	34	5	8	41	14	10	9	0	15	0	9	40	10	3	9	59	10	4	12.2
M.	17	5	55	34	11	6	17	35	3	9	19	15	2	9	38	15	3	10	17	10	5	10	36	10	6	13.2
Tu.	18	6	38	35	4	6	56	35	6	9	57	15	4	10	14	15	4	10	54	10	7	11	11	10	7	14.2
W.	19	7	14	35	7	7	32	35	6	10	30	15	4	10	45	15	3	11	28	10	7	11	45	10	6	15.2
Th.	20	7	48	35	4	8	4	35	11	11	0	15	2	11	16	15	0	—	—	—	—	0	2	10	5	16.2
F.	21	8	20	34	9	8	36	34	5	11	33	14	10	11	51	14	8	0	19	10	4	0	36	10	3	17.2
S.	22	8	52	34	0	9	8	33	7	—	—	—	—	0	10	14	5	0	54	10	1	1	13	9	11	18.2
M.	23	9	24	33	0	9	40	32	6	0	29	14	2	0	49	13	11	1	31	9	9	1	50	9	8	19.2
Tu.	24	9	57	31	9	10	14	31	2	1	10	13	8	1	32	13	5	2	10	9	6	2	32	9	5	20.2
W.	25	10	34	30	6	10	56	30	0	1	56	13	3	2	22	13	0	2	55	9	3	3	21	9	2	21.2
Th.	26	11	20	29	5	11	48	29	0	2	49	12	10	3	21	12	8	3	48	9	0	4	19	8	11	22.2
F.	27	—	—	—	—	0	20	28	10	3	54	12	7	4	31	12	8	4	51	8	10	5	24	8	10	23.2
S.	28	0	54	29	1	1	27	29	6	5	7	12	10	5	40	13	1	5	57	8	11	6	27	9	1	24.2
M.	29	2	0	30	1	2	34	30	11	6	9	13	5	6	38	13	9	6	56	9	4	7	26	9	7	25.2
Tu.	30	3	8	31	11	3	41	32	11	7	6	14	2	7	32	14	6	7	55	9	10	8	23	10	0	26.2
W.	31	4	13	34	0	4	43	35	2	7	56	15	0	8	20	15	5	8	50	10	3	9	17	10	6	27.2
Half Moon Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	2	59	Add.	9	3	42	Add.	17	3	50	Add.	25	3	22	Add.
2	3	6		10	3	45		18	3	48		26	3	16	
3	3	13		11	3	47		19	3	46		27	3	10	
4	3	19		12	3	49		20	3	44		28	3	3	
5	3	25		13	3	50		21	3	41		29	2	56	
6	3	30		14	3	51		22	3	37		30	2	48	
7	3	35		15	3	51		23	3	32		31	2	40	
8	3	39		16	3	51		24	3	28					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.									
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.									
W.	1	9m32	8 21	8 8	8 43	8 11	5 33	6 10	5 53	7 0	2 52	9 7	3 13	10 6	Th.	2	10 23	9 5	9 1	9 27	9 4	6 15	7 3	6 37	7 6	3 33	10 5	3 53	10 1
F.	3	11 16	9 47	9 6	10 8	9 7	6 59	7 9	7 22	7 11	4 13	11 2	4 35	11 1	S.	4	0a12	10 29	9 9	10 49	9 9	7 43	8 1	8 3	8 2	4 57	11 8	5 19	11 1
♄.	5	1 11	11 10	9 9	11 32	9 9	8 24	8 3	8 44	8 3	5 41	11 11	6 2	11 1	M.	6	2 11	11 54	9 9	—	—	9 5	8 1	9 27	7 11	6 24	11 9	6 48	11 1
Tu.	7	3 12	0 18	9 8	0 43	9 7	9 49	7 9	10 12	7 6	7 12	11 3	7 36	10 1	W.	8	4 12	1 9	9 6	1 37	9 4	10 37	7 3	11 6	7 0	8 0	10 6	8 28	10 1
Th.	9	5 9	2 8	9 2	2 39	8 11	11 41	6 8	—	—	8 58	9 9	9 33	9 1	F.	10	6 4	3 11	8 9	3 44	8 7	0 20	6 4	1 2	6 1	10 9	9 1	10 47	8 1
S.	11	6 55	4 18	8 6	4 54	8 4	1 45	6 0	2 30	5 11	11 26	8 10	—	—	S.	11	6 55	4 18	8 6	4 54	8 4	1 45	6 0	2 30	5 11	11 26	8 10	—	—
♄.	12	7 44	5 30	8 3	6 5	8 3	3 8	6 1	3 41	6 3	0 3	8 10	0 39	8 1	M.	13	8 31	6 39	8 3	7 13	8 4	4 10	6 5	4 36	6 7	1 13	8 11	1 45	9 1
Tu.	14	9 17	7 41	8 5	8 7	8 7	4 59	6 8	5 21	6 9	2 14	9 3	2 39	9 1	W.	15	10 2	8 32	8 9	8 54	8 11	5 43	6 11	6 4	7 0	3 2	9 9	3 23	9 1
Th.	16	10 48	9 16	9 0	9 36	9 1	6 26	7 1	6 47	7 2	3 43	10 2	4 2	10 1	F.	17	11 34	9 55	9 2	10 14	9 3	7 7	7 3	7 28	7 4	4 21	10 6	4 41	10 1
S.	18	morn.	10 32	9 3	10 50	9 3	7 47	7 4	8 4	7 4	5 1	10 9	5 19	10 1	S.	18	morn.	10 32	9 3	10 50	9 3	7 47	7 4	8 4	7 4	5 1	10 9	5 19	10 1
♄.	19	0 20	11 7	9 3	11 23	9 2	8 20	7 4	8 36	7 4	5 36	10 9	5 52	10 1	M.	20	1 7	11 38	9 1	11 54	9 1	8 50	7 3	9 5	7 1	6 8	10 7	6 24	10 1
Tu.	21	1 55	—	—	0 12	9 0	9 21	6 11	9 37	6 10	6 41	10 3	6 59	10 1	W.	22	2 42	0 30	8 11	0 48	8 10	9 53	6 8	10 10	6 6	7 17	9 9	7 34	9 1
Th.	23	3 29	1 7	8 10	1 28	8 9	10 29	6 4	10 49	6 2	7 52	9 4	8 11	9 1	F.	24	4 16	1 50	8 8	2 13	8 6	11 13	6 0	11 42	5 10	8 33	8 10	8 58	8 1
S.	25	5 2	2 38	8 5	3 4	8 4	—	—	0 15	5 8	9 27	8 6	9 57	8 1	S.	25	5 2	2 38	8 5	3 4	8 4	—	—	0 15	5 8	9 27	8 6	9 57	8 1
♄.	26	5 48	3 31	8 3	4 1	8 2	0 49	5 6	1 26	5 6	10 30	8 4	11 3	8 1	M.	27	6 35	4 32	8 1	5 5	8 1	2 5	5 6	2 42	5 8	11 38	8 4	—	—
Tu.	28	7 22	5 39	8 1	6 10	8 2	3 17	5 11	3 45	6 2	0 12	8 6	0 44	8 1	W.	29	8 10	6 41	8 3	7 12	8 4	4 11	6 5	4 36	6 7	1 14	8 11	1 45	9 1
Th.	30	9 1	7 40	8 6	8 6	8 9	4 58	6 10	5 19	7 0	2 13	9 6	2 37	9 1	F.	31	9 55	8 30	9 0	8 54	9 2	5 41	7 3	6 5	7 5	3 0	10 2	3 23	10 1
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.								5ft. 7in.														
Phases of the Moon.												Moon's Declination at Noon.																	
D. H. M.												M.D. ° ' "																	
New- - - - - 4 7 40 Morning.												1 0 N.20 9 16 N.15 17 12 S.14 25 12 S.27																	
First Quarter 10 10 4 Afternoon.												2 4 42 10 13 39 18 14 52 26 9 19																	
Full - - - - - 18 1 52 Afternoon.												3 8 55 11 10 21 19 16 51 27 5 34																	
Last Quarter- 26 5 22 Afternoon.												4 12 42 12 6 34 20 18 4 28 1 30																	
In Perigee- - 5 11 0 Afternoon.												5 15 42 13 2 34 21 18 30 29 2 N.40																	
In Apogee- - 21 11 0 Morning.												6 17 40 14 18 29 22 18 8 30 7 3																	
												7 18 25 15 5 24 23 16 58 31 11 5																	
												8 17 54 16 9 2 24 15 2																	

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4-m. | SLIGO BAY add 9 m.

MAY, 1867.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
W.	1	2 5 12 8	2 27 13 2	2 18 10 2	2 44 10 7	2 30 11 0	2 58 11 5	26.6						
Th.	2	2 50 13 8	3 12 14 2	3 9 11 0	3 32 11 4	3 24 11 9	3 51 12 1	27.6						
F.	3	3 33 14 7	3 55 15 0	3 55 11 8	4 18 11 11	4 15 12 5	4 40 12 8	28.6						
S.	4	4 16 15 5	4 37 15 8	4 40 12 2	5 3 12 4	5 3 12 10	5 24 13 0	●						
M.	5	4 59 15 10	5 22 15 11	5 26 12 5	5 49 12 5	5 46 13 1	6 9 13 2	1.2						
M.	6	5 45 15 9	6 8 15 7	6 12 12 5	6 35 12 3	6 32 13 1	6 56 13 0	2.2						
Tu.	7	6 32 15 3	6 57 14 11	6 58 12 1	7 22 11 10	7 19 12 11	7 42 12 9	3.2						
W.	8	7 23 14 6	7 52 13 11	7 47 11 6	8 12 11 2	8 6 12 6	8 31 12 2	4.2						
Th.	9	8 21 13 3	8 52 12 8	8 38 10 10	9 5 10 5	8 55 11 10	9 20 11 5	5.2						
F.	10	9 23 12 2	9 57 11 10	9 33 10 1	10 1 9 10	9 47 11 2	10 20 10 10	6.2						
S.	11	10 24 11 6	11 13 11 6	10 33 9 8	11 11 9 7	10 55 10 6	11 30 10 4	7.2						
M.	12	11 51 11 7	—	11 47 9 6	—	—	0 4 10 3	8.2						
M.	13	0 25 11 8	0 57 11 11	0 23 9 7	0 59 9 9	0 35 10 4	1 9 10 6	9.2						
Tu.	14	1 25 12 3	1 50 12 6	1 32 9 11	2 3 10 1	1 40 10 8	2 14 10 11	10.2						
W.	15	2 15 12 10	2 39 13 1	2 31 10 4	2 57 10 6	2 44 11 1	3 12 11 4	11.2						
Th.	16	3 2 13 3	3 22 13 6	3 20 10 9	3 42 10 11	3 38 11 6	4 1 11 8	12.2						
F.	17	3 41 13 8	4 1 13 10	4 3 11 0	4 24 11 2	4 24 11 9	4 47 11 10	13.2						
S.	18	4 20 13 11	4 37 14 0	4 44 11 3	5 2 11 3	5 7 11 11	5 25 11 11	○						
M.	19	4 54 14 1	5 11 14 0	5 20 11 3	5 38 11 3	5 41 11 11	5 59 11 11	15.2						
M.	20	5 28 13 11	5 45 13 9	5 55 11 2	6 12 11 1	6 16 11 10	6 33 11 9	16.2						
Tu.	21	6 3 13 7	6 20 13 4	6 29 11 0	6 46 10 10	6 50 11 8	7 7 11 7	17.2						
W.	22	6 38 13 1	6 56 12 10	7 3 10 8	7 20 10 6	7 24 11 6	7 41 11 4	18.2						
Th.	23	7 15 12 7	7 35 12 4	7 38 10 3	7 56 10 1	7 58 11 3	8 15 11 1	19.2						
F.	24	7 57 12 0	8 20 11 8	8 14 9 11	8 34 9 9	8 33 10 11	8 52 10 9	20.2						
S.	25	8 46 11 4	9 11 11 1	8 57 9 7	9 21 9 5	9 12 10 7	9 35 10 5	21.2						
M.	26	9 40 10 11	10 11 10 9	9 45 9 3	10 12 9 2	10 3 10 3	10 34 10 1	22.2						
M.	27	10 46 10 10	11 22 11 0	10 45 9 2	11 20 9 3	11 6 10 0	11 38 10 0	23.2						
Tu.	28	11 56 11 4	—	11 53 9 4	—	—	0 8 10 1	24.2						
W.	29	0 26 11 8	0 57 12 1	0 25 9 7	0 58 9 10	0 37 10 4	1 8 10 7	25.2						
Th.	30	1 24 12 6	1 49 13 0	1 32 10 1	2 2 10 5	1 40 10 11	2 12 11 3	26.2						
F.	31	2 14 13 6	2 40 13 11	2 30 10 9	2 57 11 1	2 43 11 7	3 13 11 10	27.2						
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	2 59	Add.	9	3 42	Add.	17	3 50	Add.	25	3 22	Add.
2	3 6		10	3 45		18	3 48		26	3 16	
3	3 13		11	3 47		19	3 46		27	3 10	
4	3 19		12	3 49		20	3 44		28	3 3	
5	3 25		13	3 50		21	3 41		29	2 56	
6	3 30		14	3 51		22	3 37		30	2 48	
7	3 35		15	3 51		23	3 32		31	2 40	
8	3 39		16	3 51		24	3 28				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

JUNE, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																											
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.																				
S.	1	10m52	2 15 18 7	2 38 19 3	4 7 15 1	4 34 15 5	10 9 12 6	10 33 12 9	S.	2	11 52	3 2 19 9	3 27 20 0	4 59 15 9	5 23 16 0	10 58 12 11	11 22 13	M.	3	0a54	3 51 20 2	4 16 20 3	5 48 16 1	6 14 16 4	11 46 13 3	—	—	—	—																		
Tu.	4	1 57	4 40 20 3	5 42 20 1	6 38 16 3	7 0 16 5	0 12 13 3	0 38 13	W.	5	2 58	5 30 19 9	5 54 19 5	7 22 16 0	7 47 16 2	1 4 13 1	1 30 13	Th.	6	3 56	6 20 18 11	6 46 18 3	8 11 15 6	8 35 15 8	1 55 12 10	2 21 12																					
F.	7	4 50	7 12 17 7	7 40 16 11	8 59 14 8	9 22 14 10	2 47 12 4	3 13 12	S.	8	5 41	8 8 16 3	8 36 15 8	9 48 13 9	10 13 13 11	3 39 11 9	4 5 11	S.	9	6 30	9 5 15 3	9 36 14 11	10 40 12 11	11 8 13 2	4 33 11 2	5 1 10 1																					
M.	10	7 16	10 10 14 9	10 46 14 8	11 39 12 6	—	5 30 10 8	6 2 10	Tu.	11	8 1	11 20 14 8	11 52 14 10	0 17 12 11	0 54 12 7	6 35 10 5	7 7 10	W.	12	8 47	—	0 22 15 0	1 28 13 1	2 2 13 0	7 39 10 7	8 11 10																					
Th.	13	9 32	0 51 15 3	1 19 15 7	2 33 13 4	3 2 13 6	8 42 11 0	9 12 11	F.	14	10 18	1 44 16 0	2 6 16 4	3 28 13 9	3 53 13 11	9 38 11 4	10 1 11	S.	15	11 4	2 27 16 8	2 47 16 11	4 17 14 1	4 40 14 3	10 23 11 7	10 43 11																					
S.	16	11 51	3 6 17 2	3 25 17 4	5 0 14 4	5 19 14 8	11 2 11 9	11 21 11	S.	17	morn.	3 43 17 4	4 1 17 5	5 37 14 6	5 54 14 10	11 39 11 10	11 57 11	M.	18	0 39	4 20 17 4	4 37 17 4	6 11 14 6	6 29 14 11	—	0 16 11																					
Tu.	19	1 26	4 53 17 4	5 9 17 3	6 46 14 5	7 0 14 10	0 34 11 9	0 52 11	W.	20	2 13	5 25 17 1	5 41 17 0	7 15 14 2	7 30 14 7	1 9 11 8	1 26 11	Th.	21	3 0	5 59 16 10	6 18 16 8	7 47 13 9	8 4 14 2	1 43 11 7	2 0 11																					
F.	22	3 46	6 39 16 4	7 0 16 0	8 21 13 4	8 38 13 8	2 19 11 5	2 40 11	S.	23	4 31	7 22 15 8	7 45 15 4	8 56 12 10	9 17 13 3	3 1 11 3	3 22 11	S.	24	5 17	8 9 15 0	8 35 14 9	9 38 12 6	10 1 12 10	3 43 11 0	4 7 10																					
M.	25	6 3	9 3 14 8	9 32 14 7	10 29 12 3	10 59 12 7	4 32 10 9	4 59 10	Tu.	26	6 51	10 5 14 8	10 41 14 10	11 31 12 3	—	5 26 10 6	5 57 10	W.	27	7 42	11 15 15 2	11 49 15 7	0 9 12 9	0 48 12 9	6 30 10 6	7 3 10																					
Th.	28	8 36	—	0 21 16 1	1 26 13 3	2 4 13 6	7 36 11 0	8 10 11	F.	29	9 33	0 53 16 7	1 24 17 3	2 39 13 10	3 12 14 3	8 44 11 7	9 16 11	S.	30	10 34	1 52 17 10	2 19 18 6	3 42 14 7	4 11 15 0	9 46 12 3	10 14 12																					
S.	30	10 34	1 52 17 10	2 19 18 6	3 42 14 7	4 11 15 0	9 46 12 3	10 14 12	Half Mean Spring } 9ft. 6in.								7ft. 9in.								6ft. 4in.																						
Range.																																															
Phases of the Moon.																								Moon's Declination at Noon.																							
D. H. M.																								M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '																							
New - - - - -	2	3	12	Afternoon.	1	14	N.29	9	3	N.46	17	18	S.33	25	1	N.	1	14	N.29	9	3	N.46	17	18	S.33	25	1	N.																			
First Quarter -	9	6	37	Morning.	2	17	1	10	0	S.20	18	18	25	26	5		2	17	1	10	0	S.20	18	18	25	26	5																				
Full - - - - -	17	4	54	Morning.	3	18	22	11	4	20	19	17	29	27	9		3	18	22	11	4	20	19	17	29	27	9																				
Last Quarter -	25	5	28	Morning.	4	18	24	12	8	4	20	15	47	28	13		4	18	24	12	8	4	20	15	47	28	13																				
In Perigee - -	3	6	0	Morning.	5	17	8	13	11	24	21	13	23	29	15		5	17	8	13	11	24	21	13	23	29	15																				
In Apogee - -	17	4	0	Afternoon.	6	14	46	14	14	12	22	10	23	30	17		6	14	46	14	14	12	22	10	23	30	17																				
					7	11	34	15	16	23	23	6	53				7	11	34	15	16	23	23	6	53																						
					8	7	48	16	17	51	24	3	0				8	7	48	16	17	51	24	3	0																						

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, —
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

JUNE, 1867.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE. AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	
S.	1	9 34 18 4	10 0 18 9	11 22 15 8	11 47 16 0	0 26 17 10	0 51 18 8	28.2						
S.	2	10 26 19 1	10 53 19 4	— —	0 11 16 3	1 16 18 8	1 41 19 1	●						
M.	3	11 19 19 6	11 45 19 7	0 35 16 6	0 59 16 8	2 5 19 4	2 29 19 7	0.9						
Tu.	4	— —	0 12 19 7	1 22 16 9	1 47 16 9	2 53 19 10	3 10 19 11	1.9						
W.	5	0 39 19 6	1 7 19 4	2 11 16 9	2 35 16 7	3 41 19 11	4 6 19 10	2.9						
Th.	6	1 34 19 1	2 1 18 9	3 0 16 5	3 24 16 2	4 30 19 8	4 55 19 5	3.9						
F.	7	2 28 18 4	3 54 17 10	3 49 15 11	4 15 15 6	5 22 19 2	5 48 18 9	4.9						
S.	8	3 20 17 4	3 47 16 10	4 42 15 1	5 10 14 9	6 12 18 5	6 40 18 0	5.9						
S.	9	4 14 16 4	4 40 15 10	5 39 14 5	6 10 14 2	7 8 17 7	7 37 17 3	6.9						
M.	10	5 6 15 6	5 34 15 3	6 43 13 10	7 16 13 8	8 11 16 11	8 45 16 8	7.9						
Tu.	11	6 3 15 1	6 34 15 2	7 52 13 7	8 27 13 8	9 20 16 6	9 53 16 5	8.9						
W.	12	7 5 15 4	7 37 15 7	8 59 13 10	9 30 13 11	10 22 16 5	10 54 16 6	9.9						
Th.	13	8 7 15 10	8 35 16 1	9 59 14 1	10 27 14 3	11 25 16 7	11 55 16 9	10.9						
F.	14	9 1 16 4	9 24 16 6	10 54 14 5	11 18 14 7	— —	0 23 16 11	11.9						
S.	15	9 47 16 9	10 9 16 11	11 39 14 9	12 0 14 11	0 47 17 1	1 9 17 3	12.9						
S.	16	10 29 17 1	10 49 17 2	— —	0 20 15 0	1 31 17 6	1 51 17 8	13.9						
M.	17	11 10 17 3	11 30 17 3	0 39 15 1	0 58 15 2	2 10 17 9	2 27 17 11	14.9						
Tu.	18	11 49 17 3	— —	1 16 15 3	1 34 15 3	2 47 18 0	3 4 18 1	15.9						
W.	19	0 8 17 3	0 26 17 3	1 52 15 2	2 8 15 2	3 20 18 1	3 37 18 2	16.9						
Th.	20	0 44 17 3	1 3 17 2	2 24 15 1	2 40 15 0	3 55 18 1	4 11 18 1	17.9						
F.	21	1 21 17 1	1 40 17 0	2 56 14 11	3 11 14 10	4 28 18 0	4 45 17 11	18.9						
S.	22	1 59 16 11	2 21 16 9	3 29 14 9	3 48 14 7	5 4 17 10	5 23 17 9	19.9						
S.	23	2 43 16 6	3 4 16 3	4 9 14 5	4 31 14 3	5 43 17 7	6 2 17 5	20.9						
M.	24	3 25 16 1	3 48 15 10	4 53 14 1	5 16 13 11	6 23 17 2	6 45 17 0	21.9						
Tu.	25	4 12 15 7	4 37 15 5	5 41 13 9	6 9 13 7	7 10 16 10	7 39 16 8	22.9						
W.	26	5 3 15 3	5 30 15 2	6 40 13 6	7 12 13 6	8 8 16 7	8 40 16 6	23.9						
Th.	27	6 0 15 3	6 30 15 6	7 46 13 7	8 23 13 9	9 15 16 6	9 47 16 7	24.9						
F.	28	7 2 16 0	7 36 16 5	8 55 14 0	9 27 14 4	10 19 16 9	10 53 16 11	25.9						
S.	29	8 9 16 11	8 39 17 4	9 58 14 8	10 29 15 0	11 24 17 2	11 56 17 6	26.9						
S.	30	9 9 17 10	9 37 18 3	10 58 15 4	11 25 15 8	— —	0 27 17 11	27.9						
Half Moon Spring } Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	2	31	Add.	9	1	8	Add.	17	0	30	Sub.	25	2	13	Sub.
2	2	22		10	0	57		18	0	43		26	2	25	
3	2	12		11	0	45		19	0	55		27	2	38	
4	2	2		12	0	33		20	1	8		28	2	50	
5	1	52	Sub.	13	0	20	Sub.	21	1	21		29	3	3	
6	1	42		14	0	8		22	1	34		30	3	15	
7	1	31		15	0	4		23	1	47					
8	1	20		16	0	17		24	2	0					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. SHEERNESS subtract 3 m. London 0 m.

JUNE, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																							
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
S.	1	10m52	10 34	11 5	10 59	11 8	4 51	20 3	5 16	20 9	1 44	13 9	2 10	14 1																													
S.	2	11 52	11 23	11 10	11 48	11 11	5 40	21 2	6 42	21 5	2 35	14 5	2 59	14 8																													
M.	3	0a54	—	—	0 12	12 0	6 29	21 8	6 54	21 10	3 22	14 10	3 46	15 1																													
Tu.	4	1 57	0 35	12 0	1 0	12 0	7 19	21 11	7 44	21 10	4 10	15 2	4 34	15 1																													
W.	5	2 58	1 25	11 11	1 50	11 10	8 8	21 9	8 34	21 6	4 58	15 0	5 24	14 9																													
Th.	6	3 56	2 16	11 8	2 42	11 6	8 59	21 1	9 25	20 7	5 50	14 5	6 16	14 6																													
F.	7	4 50	3 8	11 3	3 34	11 1	9 51	20 0	10 17	19 6	6 44	13 7	7 13	13 3																													
S.	8	5 41	3 59	10 11	4 25	10 8	10 46	18 11	11 18	18 5	7 42	12 10	8 11	12 6																													
S.	9	6 30	4 52	10 6	5 21	10 4	11 52	18 0	—	—	8 42	12 2	9 14	11 11																													
M.	10	7 16	5 51	10 2	6 22	10 0	0 28	17 7	1 0	17 3	9 47	11 9	10 21	11 7																													
Tu.	11	8 1	6 59	10 1	7 35	10 1	1 31	17 2	2 1	17 1	10 53	11 6	11 24	11 7																													
W.	12	8 47	8 7	10 2	8 37	10 3	2 30	17 3	2 59	17 7	11 51	11 9	—	—																													
Th.	13	9 32	9 6	10 4	9 34	10 6	3 27	17 10	3 56	18 2	0 18	11 11	0 46	12 1																													
F.	14	10 18	10 2	10 7	10 28	10 8	4 23	18 5	4 47	18 8	1 13	12 4	1 39	12 7																													
S.	15	11 4	10 50	10 9	11 12	10 11	5 8	18 10	5 29	19 1	2 2	12 9	2 24	12 10																													
S.	16	11 51	11 23	11 0	11 52	11 0	5 49	19 2	6 8	19 3	2 45	13 0	3 3	13 1																													
M.	17	morn.	—	—	0 11	11 0	6 28	19 4	6 47	19 4	3 21	13 2	3 39	13 1																													
Tu.	18	0 39	0 29	11 0	0 46	11 0	7 5	19 5	7 23	19 5	3 56	13 4	4 14	13 4																													
W.	19	1 26	1 4	10 11	1 22	10 11	7 41	19 5	7 58	19 4	4 31	13 4	4 47	13 4																													
Th.	20	2 13	1 39	10 10	1 55	10 9	8 14	19 3	8 30	19 2	5 3	13 2	5 20	13 1																													
F.	21	3 0	2 12	10 8	2 28	10 7	8 47	19 0	9 5	18 9	5 37	12 11	5 55	12 9																													
S.	22	3 46	2 47	10 6	3 6	10 5	9 24	18 7	9 45	18 4	6 15	12 7	6 38	12 5																													
S.	23	4 31	3 27	10 4	3 48	10 3	10 6	18 1	10 29	17 10	7 1	12 3	7 24	12 1																													
M.	24	5 17	4 9	10 2	4 30	10 1	10 53	17 7	11 21	17 4	7 48	11 11	8 14	11 9																													
Tu.	25	6 3	4 55	10 0	5 21	10 0	11 52	17 3	—	—	8 41	11 8	9 11	11 7																													
W.	26	6 51	5 49	9 11	6 18	10 0	0 25	17 1	0 56	17 0	9 43	11 6	10 16	11 7																													
Th.	27	7 42	6 53	10 1	7 31	10 2	1 27	17 1	1 58	17 3	10 50	11 8	11 20	11 17																													
F.	28	8 36	8 3	10 4	8 34	10 6	2 27	17 8	2 56	18 2	11 49	12 3	—	—																													
S.	29	9 33	9 5	10 9	9 36	11 0	3 26	18 9	3 57	19 4	0 17	12 7	0 47	13 0																													
S.	30	10 34	10 7	11 2	10 36	11 5	4 27	19 10	4 54	20 3	1 17	13 4	1 47	13 8																													
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.																								
Phases of the Moon.																						Moon's Declination at Noon.																					
D. H. M.																						M. D. ° ' "																					
New - - - 2 3 12 Afternoon.																						1 14 N. 29 9 3 N. 46 17 18 S. 33 25 1 N. 7																					
First Quarter - 9 6 37 Morning.																						2 17 1 10 0 S. 20 18 18 25 26 5 18																					
Full - - - 17 4 54 Morning.																						3 18 22 11 4 20 19 17 29 27 9 21																					
Last Quarter - 25 5 28 Morning.																						4 18 24 12 8 4 20 15 47 28 13 0																					
In Perigee - 3 6 0 Morning.																						5 17 8 13 11 24 21 13 23 29 15 57																					
In Apogeo - 17 4 0 Afternoon.																						6 14 46 14 14 12 22 10 23 30 17 53																					
																						7 11 34 15 16 23 23 6 53																					
																						8 7 48 16 17 51 24 3 0																					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

BRITISH AND IRISH PORTS.

JUNE, 1867.

[illegible]

Equation of Time at Noon.

M.	A.		M.D.	M.	A.		M.D.	M.	A.
I	8	Add.	17	O	30	Sub.	25	2	
O	57		18	O	43		26	2	
O	45		19	O	55		27	2	
O	33		20	I	8		28	2	
O	20		21	I	21		29	3	
O	8		22	I	34		30	3	
O	4	Sub.	23	I	47				
O	17		24	2	O				

for Mean Time at Place; if Greenwich or Railway Time be

FLD# add 6 m.

LENGTH odd 13 m.

THURSDAY odd 10

JUNE, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	10 52	10 30	9 7	10 56	9 8	9 48	25 7	10 11	26 2	4 33	20 5	5 02	21 6
S.	2	11 52	11 23	9 10	11 49	9 11	10 36	26 6	11 1	26 10	5 27	21 5	5 53	21 6
M.	3	0 54	—	—	0 14	10 0	11 26	27 2	11 51	27 3	6 18	22 1	6 42	22 2
Tu.	4	1 57	0 39	10 1	1 5	10 1	—	—	0 16	27 4	7 6	22 2	7 30	22 2
W.	5	2 58	1 30	10 1	1 56	10 0	0 41	27 2	1 7	26 10	7 56	21 8	8 22	21 6
Th.	6	3 56	2 20	9 11	2 45	9 10	1 31	26 3	1 56	25 8	8 48	20 10	9 14	20 6
F.	7	4 50	3 11	9 8	3 36	9 6	2 22	25 0	2 47	24 4	9 38	19 7	10 2	19 6
S.	8	5 41	4 2	9 4	4 29	9 2	3 13	23 7	3 40	22 11	10 27	18 4	10 52	17 6
S.	9	6 30	4 57	9 0	5 26	8 10	4 10	22 4	4 42	21 9	11 17	17 3	11 42	16 6
M.	10	7 16	5 56	8 8	6 28	8 6	5 15	21 4	5 52	21 2	—	—	0 11	16 6
Tu.	11	8 1	7 1	8 5	7 33	8 6	6 30	21 2	7 3	21 3	0 42	16 4	1 18	16 6
W.	12	8 47	8 4	8 6	8 34	8 7	7 33	21 6	8 2	21 9	1 53	16 6	2 26	16 6
Th.	13	9 32	9 4	8 8	9 33	8 9	8 30	22 1	8 57	22 5	2 59	17 1	3 29	17 6
F.	14	10 18	9 59	8 10	10 22	8 11	9 20	22 10	9 41	23 1	3 57	17 10	4 22	18 6
S.	15	11 4	10 44	9 0	11 6	9 0	10 1	23 5	10 21	23 7	4 46	18 6	5 9	18 6
S.	16	11 51	11 26	9 0	11 46	9 1	10 40	23 9	10 59	23 10	5 30	18 11	5 51	19 6
M.	17	morn.	—	—	0 6	9 1	11 18	24 0	11 36	24 1	6 10	19 2	6 28	19 6
Tu.	18	0 39	0 25	9 2	0 43	9 2	11 55	24 1	—	—	6 46	19 4	7 3	19 6
W.	19	1 26	1 1	9 2	1 19	9 2	0 12	24 1	0 29	24 1	7 20	19 3	7 36	19 6
Th.	20	2 13	1 36	9 2	1 52	9 2	0 46	24 0	1 2	23 10	7 52	19 1	8 8	18 6
F.	21	3 0	2 8	9 2	2 25	9 2	1 18	23 7	1 35	23 4	8 27	18 8	8 46	18 6
S.	22	3 46	2 44	9 1	3 4	9 0	1 54	23 1	2 15	22 9	9 6	18 3	9 26	18 6
S.	23	4 31	3 25	9 0	3 46	8 11	2 36	22 6	2 57	22 2	9 46	17 8	10 6	17 6
M.	24	5 17	4 8	8 10	4 31	8 9	3 18	21 11	3 42	21 6	10 28	17 2	10 51	16 6
Tu.	25	6 3	4 56	8 9	5 23	8 8	4 9	21 3	4 39	21 11	11 14	16 8	11 39	16 6
W.	26	6 51	5 52	8 7	6 23	8 7	5 11	21 0	5 46	21 1	—	—	0 6	16 6
Th.	27	7 42	6 56	8 6	7 29	8 7	6 25	21 4	6 58	21 9	0 38	16 7	1 12	16 6
F.	28	8 36	8 1	8 9	8 33	8 11	7 30	22 4	8 2	23 0	1 49	17 3	2 25	17 6
S.	29	9 33	9 5	9 1	9 37	9 3	8 32	23 7	9 0	24 3	3 1	18 6	3 34	19 6
S.	30	10 34	10 7	9 5	10 35	9 6	9 27	24 11	9 53	25 7	4 6	19 9	4 37	20 6
Half Mean Spring } Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			

Phases of the Moon.

	D.	H.	M.	
New - - - - -	2	3	12	Afternoon.
First Quarter -	9	6	37	Morning.
Full - - - - -	17	4	54	Morning.
Last Quarter -	25	5	28	Morning.
<hr/>				
In Perigee - -	3	6	0	Morning.
In Apogee - -	17	4	0	Afternoon.

Moon's Declination at Noon.

M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	
1	14	N.29	9	3	N.46	17	18	S.33	25	1	N.
2	17	1	10	0	S.20	18	18	25	26	5	
3	18	22	11	4	20	19	17	29	27	9	
4	18	24	12	8	4	20	15	47	28	13	
5	17	8	13	11	24	21	13	23	29	15	
6	14	46	14	14	12	22	10	23	30	17	
7	11	34	15	16	23	23	6	53	31		
8	7	48	16	17	51	24	3	0			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

JUNE, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age at Noon.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H. M. P. I.			H. M. P. I.			H. M. P. I.			H. M. P. I.			H. M. P. I.			H. M. P. I.			H. M. P. I.			H. M. P. I.			D.
S.	1	5 14 36	3			5 41 37	3			8 43 15	9			9 6 16	2			9 43 10	9			10 6 11	0			28.2
S.	2	6 8 37	11			6 34 38	4			9 30 16	5			9 54 16	7			10 28 11	2			10 51 11	3			●
M.	3	7 0 38	10			7 26 39	2			10 17 16	9			10 39 16	10			11 14 11	5			11 38 11	5			0.9
Tu.	4	7 50 39	2			8 14 38	11			11 2 16	9			11 26 16	7			—	—			0 3 11	4			1.9
W.	5	8 39 38	7			9 2 38	1			11 53 16	5			—	—			0 29 11	3			0 56 11	1			2.9
Th.	6	9 25 37	4			9 48 36	5			0 20 16	2			0 48 15	9			1 23 10	11			1 50 10	8			3.9
F.	7	10 10 35	5			10 32 34	4			1 17 15	4			1 45 14	11			2 17 10	5			2 44 10	3			4.9
S.	8	10 54 33	3			11 19 32	4			2 14 14	6			2 43 14	2			3 13 10	0			3 42 9	9			5.9
S.	9	11 46 31	5			—	—			3 15 13	10			3 49 13	7			4 14 9	7			4 48 9	5			☽
M.	10	0 16 30	9			0 47 30	3			4 24 13	4			5 0 13	3			5 20 9	3			5 51 9	2			7.9
Tu.	11	1 21 30	1			1 54 30	1			5 33 13	3			6 4 13	4			6 21 9	3			6 51 9	4			8.9
W.	12	2 26 30	3			2 59 30	7			6 32 13	5			6 59 13	7			7 19 9	5			7 47 9	6			9.9
Th.	13	3 33 31	0			4 6 31	5			7 26 13	9			7 53 13	11			8 16 9	7			8 44 9	8			10.9
F.	14	4 36 32	0			5 2 32	7			8 16 14	1			8 37 14	3			9 12 9	10			9 36 9	11			11.9
S.	15	5 27 33	2			5 50 33	6			8 57 14	5			9 16 14	7			9 57 10	0			10 16 10	1			12.9
S.	16	6 12 33	10			6 33 34	0			9 34 14	8			9 53 14	9			10 33 10	2			10 50 10	3			13.9
M.	17	6 52 34	2			7 11 34	4			10 10 14	10			10 27 14	10			11 8 10	4			11 25 10	4			○
Tu.	18	7 30 34	6			7 47 34	6			10 43 14	10			10 59 14	10			11 42 10	4			12 0 10	3			15.9
W.	19	8 3 34	5			8 19 34	4			11 15 14	9			11 32 14	8			—	—			0 18 10	3			16.9
Th.	20	8 35 34	3			8 50 34	1			11 49 14	7			—	—			0 35 10	2			0 52 10	1			17.9
F.	21	9 6 33	11			9 24 33	8			0 6 14	6			0 26 14	4			1 9 10	0			1 28 9	11			18.9
S.	22	9 42 33	3			10 0 32	10			0 47 14	3			1 10 14	0			1 48 9	10			2 10 9	8			19.9
S.	23	10 17 32	3			10 35 31	10			1 33 13	10			1 56 13	8			2 33 9	7			2 56 9	6			20.9
M.	24	10 55 31	3			11 18 30	10			2 19 13	6			2 46 13	4			3 19 9	5			3 44 9	4			21.9
Tu.	25	11 44 30	6			—	—			3 15 13	3			3 47 13	2			4 14 9	3			4 45 9	2			☾
W.	26	0 12 30	3			0 42 30	2			4 20 13	2			4 55 13	3			5 16 9	2			5 47 9	2			23.9
Th.	27	1 16 30	4			1 49 30	10			5 30 13	5			6 0 13	8			6 19 9	3			6 48 9	5			24.9
F.	28	2 23 31	6			2 58 32	3			6 29 14	0			6 58 14	4			7 16 9	8			7 46 9	11			25.9
S.	29	3 35 33	1			4 12 34	1			7 29 14	8			7 56 15	0			8 18 10	1			8 49 10	3			26.9
S.	30	4 46 35	1			5 18 36	2			8 23 15	4			8 48 15	9			9 20 10	6			9 48 10	9			27.9
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	2	31	Add.	9	1	8	Add.	17	0	30	Sub.	25	2	13	Sub.
2	2	22		10	0	57		18	0	43		26	2	25	
3	2	12		11	0	45		19	0	55		27	2	38	
4	2	2		12	0	33		20	1	8		28	2	50	
5	1	53		13	0	20		21	1	21		29	3	3	
6	1	43		14	0	8		22	1	34		30	3	15	
7	1	31		15	0	4	Sub.	23	1	47					
8	1	20		16	0	17		24	2	0					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JUNE, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	
S.	1	10m52	9 18	9 4	9 42	9 6	6 30	7 8	6 55	7 10	3 46	10 11	4 9	11 8	
S.	2	11 52	10 6	9 7	10 30	9 8	7 20	7 11	7 44	8 0	4 33	11 5	4 58	11 8	
M.	3	0a54	10 53	9 9	11 17	9 9	8 7	8 2	8 30	8 2	5 23	11 10	5 47	11 10	
Tu.	4	1 57	11 40	9 8	—	—	8 52	8 1	9 15	7 11	6 10	11 10	6 34	11 7	
W.	5	2 58	0 4	9 8	0 31	9 7	9 39	7 9	10 3	7 7	7 0	11 4	7 26	11 0	
Th.	6	3 56	0 59	9 6	1 26	9 5	10 28	7 4	10 55	7 1	7 52	10 8	8 18	10 4	
F.	7	4 50	1 55	9 3	2 25	9 1	11 25	6 10	—	—	8 45	10 0	9 16	9 8	
S.	8	5 41	2 55	8 11	3 25	8 9	0 1	6 7	0 38	6 3	9 49	9 4	10 23	9 8	
S.	9	6 30	3 57	8 7	4 29	8 6	1 17	6 1	1 58	6 0	10 59	9 0	11 33	8 10	
M.	10	7 16	5 1	8 5	5 33	8 4	2 36	6 0	3 10	6 1	—	—	0 6	8 10	
Tu.	11	8 1	6 4	8 3	6 35	8 3	3 40	6 3	4 7	6 4	0 38	8 10	1 9	8 10	
W.	12	8 47	7 5	8 3	7 33	8 4	4 31	6 5	4 54	6 6	1 38	8 11	2 6	9 0	
Th.	13	9 32	8 1	8 5	8 27	8 6	5 17	6 7	5 39	6 8	2 33	9 2	2 58	9 4	
F.	14	10 18	8 50	8 8	9 11	8 9	6 0	6 9	6 21	6 10	3 20	9 7	3 40	9 8	
S.	15	11 4	9 32	8 10	9 52	8 11	6 43	6 11	7 4	6 11	3 59	9 11	4 18	10 1	
S.	16	11 51	10 11	9 0	10 29	9 0	7 24	7 0	7 43	7 0	4 37	10 2	4 56	10 8	
M.	17	morn.	10 47	9 1	11 4	9 1	8 1	7 1	8 17	7 1	5 15	10 4	5 33	10 8	
Tu.	18	0 39	11 21	9 0	11 37	9 0	8 34	7 1	8 49	7 1	5 51	10 5	6 7	10 8	
W.	19	1 26	11 53	9 0	—	—	9 5	7 0	9 20	6 11	6 23	10 3	6 40	10 8	
Th.	20	2 13	0 10	8 11	0 28	8 11	9 36	6 10	9 51	6 8	6 57	10 0	7 14	9 10	
F.	21	3 0	0 46	8 11	1 5	8 10	10 8	6 7	10 27	6 6	7 32	9 8	7 51	9 8	
S.	22	3 46	1 26	8 10	1 49	8 9	10 48	6 5	11 12	6 3	8 12	9 4	8 34	9 8	
S.	23	4 31	2 14	8 8	2 38	8 7	11 39	6 1	—	—	8 57	9 0	9 22	8 10	
M.	24	5 17	3 2	8 6	3 28	8 5	0 8	5 11	0 42	5 9	9 52	8 9	10 23	8 8	
Tu.	25	6 3	3 56	8 4	4 26	8 4	1 17	5 9	1 54	5 10	10 56	8 8	11 29	8 8	
W.	26	6 51	4 57	8 4	5 28	8 4	2 32	5 11	3 6	6 0	—	—	0 2	8 10	
Th.	27	7 42	5 59	8 4	6 30	8 4	3 38	6 3	4 4	6 6	0 34	8 11	1 5	9 8	
F.	28	8 36	7 2	8 5	7 32	8 7	4 28	6 9	4 52	6 11	1 35	9 3	2 5	9 8	
S.	29	9 33	8 2	8 9	8 30	9 0	5 16	7 1	5 41	7 3	2 34	9 10	3 1	10 8	
S.	30	10 34	8 57	9 2	9 23	9 4	6 7	7 5	6 34	7 7	3 26	10 6	3 51	10 8	
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.				
Phases of the Moon.							Moon's Declination at Noon.								
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'
New			2	3	12	Afternoon.	1	14	N.29	9	3	N.46	17	18	S.33
First Quarter			9	6	37	Morning.	2	17	1	10	0	S.20	18	18	25
Full			17	4	54	Morning.	3	18	22	11	4	20	19	17	29
Last Quarter			25	5	28	Morning.	4	18	24	12	8	4	20	15	47
							5	17	8	13	11	24	21	13	23
In Perigee			3	6	0	Morning.	6	14	46	14	14	12	22	10	23
In Apogee			17	4	0	Afternoon.	7	11	34	15	16	23	23	6	53
							8	7	48	16	17	51	24	3	0

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

. JULY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	11m36	2 45	19 2	3 11	19 9	4 39	15 4	5 6	15 10	10 41	12 9	11 8	12 18
Tu.	2	0a39	3 37	20 0	4 3	20 3	5 33	15 10	6 0	16 4	11 33	13 1	11 59	13 3
W.	3	1 40	4 30	20 3	4 54	20 2	6 26	16 1	6 51	16 7	—	—	0 27	13 2
Th.	4	2 38	5 18	20 0	5 41	19 8	7 12	16 0	7 35	16 4	0 53	13 2	1 18	13 1
F.	5	3 33	6 5	19 4	6 29	18 10	7 58	15 8	8 22	15 11	1 43	12 11	2 6	12 9
S.	6	4 24	6 53	18 3	7 17	17 7	8 44	14 11	9 4	15 1	2 30	12 7	2 55	12 4
S.	7	5 12	7 42	16 11	8 7	16 3	9 25	14 1	9 48	14 3	3 19	12 0	3 43	11 9
M.	8	5 59	8 32	15 8	8 58	15 1	10 10	13 3	10 33	13 4	4 6	11 5	4 29	11 2
Tu.	9	6 45	9 25	14 7	9 57	14 4	10 58	12 8	11 24	12 7	4 55	10 10	5 21	10 6
W.	10	7 30	10 30	14 2	11 4	14 1	11 57	12 3	—	—	5 50	10 4	6 22	10 2
Th.	11	8 16	11 38	14 1	—	—	0 31	12 4	1 9	12 5	6 54	10 1	7 26	10 2
F.	12	9 2	0 16	14 3	0 46	14 5	1 44	12 5	2 18	12 7	8 2	10 4	8 35	10 6
S.	13	9 49	1 15	14 9	1 42	15 2	2 49	12 9	3 20	13 2	9 6	10 9	9 34	10 17
S.	14	10 36	2 4	15 6	2 26	16 0	3 47	13 3	4 11	13 9	9 58	11 1	10 21	11 3
M.	15	11 24	2 47	16 4	3 6	16 9	4 33	13 9	4 55	14 3	10 43	11 5	11 21	11 6
Tu.	16	orn.	3 24	17 1	3 43	17 3	5 15	14 0	5 35	14 8	11 20	11 7	11 38	11 2
W.	17	0 11	4 2	17 4	4 19	17 6	5 53	14 3	6 11	14 11	11 56	11 9	—	—
Th.	18	0 58	4 36	17 8	4 51	17 9	6 28	14 5	6 45	15 1	0 15	11 10	0 33	11 12
F.	19	1 44	5 7	17 9	5 24	17 9	7 1	14 6	7 16	15 0	0 50	11 11	1 7	11 13
S.	20	2 30	5 41	17 8	5 59	17 7	7 32	14 3	7 49	14 9	1 24	12 0	1 42	12 0
S.	21	3 15	6 16	17 6	6 37	17 3	8 6	14 0	8 24	14 4	2 0	11 11	2 18	11 10
M.	22	4 1	6 57	16 11	7 17	16 7	8 40	13 8	8 57	13 11	2 38	11 9	2 58	11 8
Tu.	23	4 48	7 40	16 2	8 4	15 9	9 16	13 4	9 39	13 6	3 18	11 7	3 40	11 3
W.	24	5 36	8 30	15 5	8 58	15 1	10 3	13 0	10 29	13 1	4 2	11 3	4 27	11 1
Th.	25	6 27	9 27	14 10	10 0	14 11	10 58	12 9	11 29	12 9	4 54	10 10	5 21	10 2
F.	26	7 20	10 37	14 11	11 15	15 1	—	—	0 6	12 9	5 53	10 7	6 28	10 7
S.	27	8 18	11 54	15 5	—	—	0 49	12 11	1 29	13 2	7 4	10 8	7 41	10 18
S.	28	9 18	0 32	15 11	1 6	16 7	2 8	13 4	2 46	13 11	8 21	11 3	8 56	11 7
M.	29	10 19	1 39	17 3	2 8	18 0	3 22	14 2	3 54	14 11	9 31	11 11	10 3	12 3
Tu.	30	11 21	2 35	18 9	3 1	19 5	4 24	15 0	4 53	15 9	10 31	12 7	10 57	12 10
W.	31	0a21	3 27	19 11	3 52	20 2	5 21	15 6	5 48	16 3	11 23	13 1	11 48	13 2
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			

Phases of the Moon.

	D.	H.	M.	
New- - - - -	1	9	48	Afternoon.
First Quarter- -	8	5	31	Afternoon.
Full - - - - -	16	7	56	Afternoon.
Last Quarter - -	24	2	32	Afternoon.
New- - - - -	31	4	43	Morning.
In Perigee - -	1	3	0	Afternoon.
In Apogee - -	14	8	0	Afternoon.
In Perigee - -	29	12	0	Midnight.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	N.35	9	6	S.56	17	16	S.21	25	11	N.41
2	17	55	10	10	25	18	14	8	26	14	50
3	16	0	11	13	24	19	11	17	27	17	8
4	13	3	12	15	47	20	7	55	28	18	22
5	9	23	13	17	28	21	4	9	29	18	20
6	5	18	14	18	24	22	0	8	30	17	0
7	1	5	15	18	31	23	3	N.58	31	14	31
8	3	S.3	16	17	49	24	7	59			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

JULY, 1867.

WEEK DAY. MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.							
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.											
	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	D.													
1	10	6	18	9	10	36	19	1	11	51	16	0	—	—	0	55	18	3	1	22	18	8	●									
2	11	4	19	4	11	32	19	6	0	18	16	3	0	45	16	6	1	47	19	0	2	12	19	4	0.6							
3	—	—	—	—	0	1	19	7	1	10	16	8	1	36	16	10	2	40	19	7	3	5	19	10	1.6							
4	0	27	19	7	0	53	19	6	2	2	16	9	2	25	16	8	3	31	19	11	3	55	19	11	2.6							
5	1	19	19	3	1	45	19	0	2	48	16	7	3	11	16	5	4	19	19	10	4	44	19	8	3.6							
6	2	10	18	9	2	35	18	4	3	35	16	2	3	59	15	10	5	8	19	5	5	31	19	1	4.6							
7	3	0	17	10	3	23	17	4	4	24	15	6	4	48	15	1	5	56	18	9	6	20	18	5	5.6							
8	3	46	16	10	4	10	16	4	5	13	14	9	5	39	14	5	6	45	18	0	7	9	17	7	6							
9	4	34	15	10	4	58	15	4	6	6	14	1	6	34	13	9	7	36	17	3	8	4	16	11	7.6							
10	5	24	15	0	5	52	14	9	7	4	13	6	7	37	13	5	8	35	16	7	9	8	16	4	8.6							
11	6	20	14	7	6	52	14	9	8	13	13	4	8	45	13	4	9	39	16	2	10	11	16	0	9.6							
12	7	28	14	11	8	0	15	2	9	18	13	6	9	51	13	8	10	43	16	0	11	17	16	1	10.6							
13	8	31	15	5	8	57	15	8	10	22	13	10	10	50	14	0	11	50	16	3	—	—	—	—	11.6							
14	9	21	15	11	9	45	16	11	11	16	14	2	11	38	14	4	0	19	16	5	0	44	16	7	12.6							
15	10	8	16	6	10	28	16	9	11	59	14	6	—	—	—	1	6	16	10	1	1	26	17	1	13.6							
16	10	48	16	11	11	8	17	1	0	20	14	9	0	39	14	11	1	49	17	3	2	8	17	5	14.6							
17	11	28	17	3	11	48	17	5	0	57	15	0	1	15	15	1	2	26	17	8	2	45	17	10	15.6							
18	—	—	—	—	0	7	17	6	1	33	15	2	1	51	15	3	3	2	18	0	3	18	18	2	16.6							
19	0	24	17	7	0	42	17	8	2	7	15	4	2	22	15	4	3	35	18	1	3	51	18	4	17.6							
20	1	1	17	8	1	19	17	8	2	38	15	3	2	55	15	3	4	8	18	4	4	26	18	5	18.6							
21	1	38	17	8	1	57	17	7	3	12	15	3	3	29	15	2	4	43	18	4	5	1	18	3	19.6							
22	2	17	17	5	2	38	17	3	3	46	15	1	4	6	14	11	5	19	18	2	5	38	18	1	20.6							
23	3	0	17	0	3	23	16	9	4	26	14	9	4	48	14	7	5	57	17	11	6	19	17	9	21.6							
24	3	43	16	5	4	8	16	1	5	11	14	4	5	36	14	2	6	41	17	6	7	6	17	3	22.6							
25	4	33	15	10	4	59	15	6	6	3	14	0	6	34	13	9	7	31	17	1	8	1	16	10	23.6							
26	5	27	15	5	5	58	15	4	7	6	13	7	7	41	13	8	8	34	16	8	9	10	16	8	24.6							
27	6	30	15	6	7	7	15	11	8	19	13	9	8	56	14	0	9	46	16	7	10	22	16	8	25.6							
28	7	47	16	4	8	21	16	11	9	32	14	4	10	8	14	8	11	0	16	11	11	37	17	2	26.6							
29	8	54	17	5	9	26	17	11	10	40	15	0	11	13	15	4	—	—	—	0	10	17	6	27.6								
30	9	55	18	5	10	23	18	11	11	41	15	8	—	—	—	0	41	17	11	1	11	18	4	28.6								
31	10	51	19	3	11	20	19	6	0	8	16	1	0	34	16	4	1	38	18	9	2	5	19	2	29.6							
Half Moon Spring Range.																					9ft. 4in.				8ft. 0in.				9ft. 7in.			

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 27		9	4 51		17	5 48		25	6 13	
2	3 38		10	5 0		18	5 53		26	6 14	
3	3 50		11	5 8		19	5 58		27	6 14	
4	4 1		12	5 16		20	6 2		28	6 13	
5	4 12		13	5 23		21	6 5		29	6 12	
6	4 22		14	5 30		22	6 8		30	6 10	
7	4 32		15	5 37		23	6 10		31	6 8	
8	4 42		16	5 43		24	6 12				

are given for Mean Time at Place; if Greenwich or Railway Time be required,—ft
of 8 m. | SUMMER subtract 3 m. | LONDON 0 m.

JULY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.	
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
M.	1	11m36	11	3	11	7	11	30	11	10	5	20	20	9	5	47	21	1	2	14	14	0	2	42	14	4
Tu.	2	0 39	11	57	11	11	—	—	—	—	6	15	21	5	6	41	21	8	3	9	14	8	3	34	14	11
W.	3	1 40	0	23	12	0	0	49	12	1	7	8	21	10	7	34	21	11	3	59	15	1	4	25	15	2
Th.	4	2 38	1	16	12	0	1	40	11	11	7	59	21	10	8	22	21	8	4	48	15	1	5	11	14	11
F.	5	3 33	2	4	11	9	2	28	11	7	8	46	21	5	9	10	21	0	5	36	14	8	6	1	14	4
S.	6	4 24	2	53	11	5	3	17	11	3	9	35	20	6	10	0	20	0	6	26	14	0	6	53	13	7
♄	7	5 12	3	41	11	1	4	4	10	11	10	24	19	6	10	49	19	0	7	19	13	3	7	45	12	11
M.	8	5 59	4	28	10	8	4	52	10	6	11	17	18	5	11	47	17	11	8	11	12	6	8	38	12	2
Tu.	9	6 45	5	18	10	3	5	44	10	1	—	—	—	—	0	18	17	6	9	6	11	10	9	35	11	7
W.	10	7 30	6	11	10	0	6	44	9	11	0	49	17	0	1	20	16	10	10	7	11	4	10	41	11	3
Th.	11	8 16	7	21	9	10	7	53	9	11	1	50	16	8	2	19	16	8	11	12	11	2	11	41	11	3
F.	12	9 2	8	36	9	11	8	59	10	0	2	48	16	9	3	20	17	1	—	—	—	—	0	12	11	5
S.	13	9 49	9	29	10	2	9	58	10	3	3	50	17	5	4	19	17	9	0	41	11	7	1	9	11	10
♄	14	10 36	10	25	10	5	10	48	10	6	4	45	18	0	5	6	18	3	1	35	12	1	1	59	12	3
M.	15	11 24	11	11	10	8	11	33	10	9	5	27	18	6	5	48	18	9	2	22	12	5	2	45	12	8
Tu.	16	morn.	11	52	10	11	—	—	—	—	6	8	18	11	6	27	19	1	3	4	12	10	3	21	13	0
W.	17	0 11	0	10	10	11	0	29	11	0	6	46	19	2	7	4	19	4	3	38	13	1	3	56	13	3
Th.	18	0 58	0	46	11	0	1	3	11	0	7	22	19	6	7	40	19	7	4	14	13	5	4	30	13	6
F.	19	1 44	1	21	11	0	1	38	11	0	7	56	19	8	8	12	19	8	4	45	13	7	5	1	13	6
S.	20	2 30	1	55	10	11	2	10	10	11	8	28	19	9	8	46	19	8	5	18	13	5	5	36	13	4
♄	21	3 15	2	28	10	10	2	46	10	10	9	4	19	6	9	22	19	4	5	54	13	3	6	13	13	1
M.	22	4 1	3	4	10	9	3	24	10	8	9	42	19	1	10	2	18	10	6	34	12	11	6	56	12	9
Tu.	23	4 48	3	44	10	7	4	4	10	6	10	23	18	8	10	47	18	4	7	19	12	7	7	43	12	5
W.	24	5 36	4	26	10	5	4	49	10	3	11	14	18	0	11	45	17	9	8	8	12	2	8	35	12	0
Th.	25	6 27	5	16	10	2	5	44	10	1	—	—	—	—	0	17	17	6	9	5	11	10	9	36	11	8
F.	26	7 20	6	12	10	1	6	46	10	1	0	50	17	3	1	23	17	3	10	12	11	8	10	47	11	8
S.	27	8 18	7	29	10	2	8	3	10	4	1	55	17	3	2	28	17	7	11	21	11	10	11	54	12	2
♄	28	9 18	8	39	10	6	9	15	10	9	3	2	18	1	3	37	18	8	—	—	—	—	0	28	12	6
M.	29	10 19	9	49	11	0	10	23	11	3	4	9	19	3	4	42	19	10	1	0	13	0	1	32	13	5
Tu.	30	11 21	10	52	11	5	11	20	11	8	5	9	20	4	5	36	20	10	2	4	13	9	2	32	14	3
W.	31	0 21	11	47	11	10	—	—	—	—	6	3	21	3	6	30	21	7	2	58	14	6	3	23	14	9

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - -	1	9	48	Afternoon.	1	18	N.35	9	6	S.56	17	16	S.21	25	14	N.41
First Quarter	8	5	31	Afternoon.	2	17	55	10	10	25	18	14	8	26	14	50
Full - - -	16	7	56	Afternoon.	3	16	0	11	13	24	19	11	17	27	17	8
Last Quarter	24	2	32	Afternoon.	4	13	3	12	15	47	20	7	55	28	18	22
New - - - -	31	4	43	Morning.	5	9	23	13	17	28	21	4	9	29	18	20
In Perigee -	1	3	0	Afternoon.	6	5	18	14	18	24	22	0	8	30	17	0
In Apogee -	14	8	0	Afternoon.	7	1	5	15	18	31	23	3	N.58	31	14	31
In Perigee -	29	12	0	Midnight.	8	3	S.3	16	17	49	24	7	59			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

BRITISH AND IRISH PORTS.

JULY, 1867.

WIND DAY.		MORNING DAY.		NORTH SHIELDS.								LEITH.								THURSO.									
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
				Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				
				H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.	
1	2	19	12	11	2	44	13	3	1	14	15	11	1	40	16	5	7	32	13	4	7	56	13						
2	3	9	13	7	3	34	13	9	2	6	16	9	2	32	17	0	8	20	14	0	8	45	14						
3	4	0	13	11	4	26	13	11	2	57	17	1	3	22	17	1	9	11	14	0	9	35	13						
4	4	51	13	10	5	15	13	7	3	46	16	11	4	10	16	9	9	59	13	9	10	24	13						
		0	13	4	6	5	13		4	35	16	6	5	0	16	2	10	50	13	1	11	16	12						
		0	12	11	6	56	12	7	5	25	15	11	5	51	15	6	11	43	12	4	—	—	—						
		1	12	2	7	47	11	10	6	17	15	1	6	44	14	8	0	9	11	11	0	35	11						
		5	11	4	8	44	10	11	7	11	14	2	7	39	13	10	1	2	11	1	1	30	10						
		5	10	8	9	47	10	5	8	9	13	6	8	40	13	2	2	0	10	5	2	31	10						
		1	10	3	10	53	10	2	9	13	12	11	9	47	12	10	3	6	9	11	3	44	9						
		3	10	3	11	54	10	4	10	17	12	10	10	48	12	10	4	16	9	7	4	48	9						
		—	—	—	0	25	10	5	11	19	13	0	11	48	13	2	5	20	8	5	50	9							
		4	10	6	1	21	10	8	—	—	—	—	0	15	13	4	6	17	10	1	6	40	10						
		45	10	10	2	6	11	0	0	39	13	7	1	0	13	10	6	59	10	8	7	18	11						
		26	11	3	2	47	11	6	1	21	14	2	1	42	14	5	7	36	11	4	7	52	11						
		5	11	9	3	21	11	11	2	2	14	8	2	20	14	11	8	9	11	11	8	26	12						
		39	12	0	3	57	12	2	2	38	15	0	2	55	15	2	8	43	12	11	8	59	12						
		14	12	3	4	31	12	11	3	11	15	3	3	27	15	4	9	16	12	3	9	32	12						
		47	12	4	5	4	12	3	3	43	15	3	3	59	15	2	9	49	12	2	10	6	12						
		21	12	2	5	39	12	2	4	16	15	2	4	34	15	1	10	24	12	1	10	43	11						
		59	12	1	6	18	12	0	4	53	15	0	5	11	14	11	11	2	11	10	11	24	11						
		38	11	11	6	58	11	9	5	32	14	10	5	54	14	8	11	46	11	5	—	—	—						
		20	11	7	7	45	11	4	6	17	14	5	6	42	14	2	0	9	11	3	0	33	11						
		12	11	1	8	42	10	10	7	7	13	11	7	37	13	8	0	59	10	9	1	27	10						
		14	10	8	9	47	10	6	8	8	13	5	8	40	13	4	1	59	10	5	2	31	10						
		24	10	7	10	59	10	8	9	16	13	4	9	54	13	5	3	9	10	3	3	51	10						
		1	33	10	11	—	—	—	10	28	13	7	11	1	13	10	4	27	10	4	5	2	10						
		0	7	11	2	0	40	11	6	11	34	14	2	—	—	—	5	37	10	10	6	7	11						
		1	11	11	10	1	41	12	2	0	5	14	7	0	35	15	1	6	36	11	10	7	1	12					
		2	9	12	7	2	35	13	0	1	3	15	7	1	30	16	1	7	23	13	0	7	46	13					
		3	0	13	5	3	24	13	8	1	56	16	6	2	22	16	11	8	10	13	11	8	34	14					
Mean Spring Range.				6 ^{ft.} 8 ^{in.}								8 ^{ft.} 2 ^{in.}								6 ^{ft.} 7 ^{in.}									

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.
3	27		9	4	51		17	5	48		25	6	13		25	6	13
3	38		10	5	0		18	5	53		26	6	14		26	6	14
3	50		11	5	8		19	5	58		27	6	14		27	6	14
4	1		12	5	16		20	6	2		28	6	13		28	6	13
4	12		13	5	23		21	6	5		29	6	12		29	6	12
4	22		14	5	30		22	6	8		30	6	10		30	6	10
4	32		15	5	37		23	6	10		31	6	8		31	6	8
4	42		16	5	43		24	6	12								

rate given for Mean Time at Place; if Greenwich or Railway Time be req
add 4 m. | LEITH add 13 m. | THURSO add 14 m

TIDE TABLES FOR THE

JULY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.	
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
M.	1	11m36	11	4	9	8	11	33	9	10	10	19	26	1	10	46	26	6	5	7	21	0	5	38	21	5
Tu.	2	0a39	12	0	9	11	—	—	—	—	11	13	26	11	11	39	27	3	6	5	21	9	6	30	22	1
W.	3	1 40	0	27	10	0	0	55	10	1	—	—	—	—	0	6	27	3	6	57	22	2	7	22	22	1
Th.	4	2 38	1	20	10	1	1	44	10	1	0	30	27	3	0	54	27	1	7	44	21	11	8	8	21	7
F.	5	3 33	2	8	10	0	2	31	9	11	1	18	26	8	1	42	26	2	8	33	21	2	8	57	20	9
S.	6	4 24	2	55	9	9	3	19	9	8	2	6	25	7	2	30	24	11	9	20	20	3	9	43	19	7
♄.	7	5 12	3	42	9	6	4	6	9	4	2	53	24	3	3	17	23	8	10	5	19	0	10	27	18	5
M.	8	5 59	4	30	9	2	4	54	9	0	3	41	22	11	4	6	22	3	10	49	17	10	11	11	17	2
Tu.	9	6 45	5	19	8	10	5	45	8	8	4	34	21	7	5	3	21	0	11	34	16	6	12	0	16	2
W.	10	7 30	6	16	8	6	6	47	8	4	5	37	20	9	6	14	20	6	—	—	—	—	0	30	15	11
Th.	11	8 16	7	19	8	3	7	52	8	3	6	48	20	6	7	22	20	8	1	1	15	9	1	37	15	9
F.	12	9 2	8	27	8	4	8	58	8	5	7	55	20	11	8	26	21	2	2	17	16	0	2	50	16	3
S.	13	9 49	9	28	8	6	9	55	8	7	8	53	21	7	9	18	21	11	3	23	16	8	3	52	17	2
♄.	14	10 36	10	19	8	8	10	42	8	9	9	40	22	4	10	1	22	8	4	18	17	5	4	43	17	10
M.	15	11 24	11	5	8	10	11	25	8	11	10	21	23	0	10	40	23	4	5	7	18	2	5	29	18	6
Tu.	16	morn.	11	45	9	0	—	—	—	—	10	59	23	6	11	17	23	9	5	50	18	9	6	9	19	0
W.	17	0 11	0	5	9	1	0	24	9	2	11	36	24	0	11	54	24	3	6	28	19	2	6	45	19	3
Th.	18	0 58	0	42	9	3	1	0	9	3	—	—	—	—	0	11	24	4	7	2	19	7	7	17	19	8
F.	19	1 44	1	17	9	4	1	33	9	4	0	27	24	6	0	44	24	6	7	34	19	8	7	51	19	8
S.	20	2 30	1	50	9	4	2	7	9	5	1	1	24	6	1	18	24	5	8	9	19	7	8	27	19	0
♄.	21	3 15	2	25	9	5	2	43	9	4	1	36	24	3	1	53	24	0	8	44	19	4	9	4	19	2
M.	22	4 1	3	2	9	3	3	21	9	3	2	12	23	9	2	32	23	5	9	23	18	11	9	43	18	7
Tu.	23	4 48	3	41	9	2	4	3	9	1	2	52	23	2	3	14	22	10	10	3	18	3	10	25	17	11
W.	24	5 36	4	26	9	0	4	52	8	11	3	37	22	5	4	3	21	11	10	48	17	6	11	11	17	2
Th.	25	6 27	5	19	8	10	5	47	8	9	4	34	21	7	5	5	21	3	11	35	16	9	—	—	—	—
F.	26	7 20	6	19	8	8	6	53	8	7	5	41	21	4	6	21	21	5	0	3	16	8	0	35	16	8
S.	27	8 18	7	29	8	7	8	6	8	9	6	59	21	9	7	36	22	3	1	13	16	10	1	54	17	2
♄.	28	9 18	8	44	8	11	9	18	9	1	8	13	22	10	8	44	23	7	2	36	17	9	3	14	18	6
M.	29	10 19	9	51	9	3	10	23	9	5	9	15	24	4	9	43	25	1	3	50	19	2	4	23	19	11
Tu.	30	11 21	10	53	9	7	11	21	9	9	10	9	25	8	10	35	26	3	4	55	20	7	5	25	21	2
W.	31	0a21	11	49	9	11	—	—	—	—	11	2	26	9	11	28	27	2	5	53	21	8	6	19	22	0

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
New - - - - -	1	9	48	Afternoon.
First Quarter -	8	5	31	Afternoon.
Full - - - - -	16	7	56	Afternoon.
Last Quarter -	25	2	32	Afternoon.
New - - - - -	31	4	43	Morning.
<hr/>				
In Perigee - -	1	3	0	Afternoon.
In Apogee - -	14	8	0	Afternoon.
In Perigee - -	29	12	0	Midnight.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	N.35	9	6	S.56	17	16	S.21	25	11	N.41
2	17	55	10	10	25	18	14	8	26	14	50
3	16	0	11	13	24	19	11	17	27	17	8
4	13	3	12	15	47	20	7	55	28	18	22
5	9	23	13	17	28	21	4	9	29	18	20
6	5	18	14	18	24	22	0	8	30	17	0
7	1	5	15	18	31	23	3	N.58	31	14	31
8	3	S.3	16	17	49	24	7	59			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 18 m. | PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

JULY, 1867.

WED. DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.														
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.												
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.												
1	5	49	37	1	6	19	37	11	9	14	16	1	9	40	16	5	10	13	10	11	10	38	11	
2	6	47	38	5	7	14	38	11	10	5	16	7	10	29	16	9	11	2	11	4	11	27	11	
3	7	40	39	2	8	4	39	1	10	53	16	9	11	16	16	9	11	53	11	4	—	—	—	
4	8	27	38	10	8	50	38	6	11	40	16	7	—	—	—	—	0	19	11	5	0	44	11	
5	9	13	37	11	9	35	37	3	0	5	16	4	0	31	16	1	1	9	11	1	1	34	10	
6	9	56	36	5	10	16	35	5	0	58	15	9	1	25	15	4	1	59	10	8	2	25	10	
7	10	36	34	4	10	55	33	3	1	51	14	11	2	17	14	7	2	50	10	3	3	16	10	
8	11	17	32	3	11	40	31	3	2	43	14	2	3	11	13	9	3	42	9	9	4	9	9	
9	—	—	—	—	0	5	30	4	3	41	13	5	4	12	13	2	4	39	9	4	5	9	9	
10	0	36	29	9	1	7	29	3	4	46	13	0	5	21	12	11	5	40	9	0	6	10	9	
11	1	39	29	1	2	12	29	1	5	51	12	11	6	22	13	0	6	39	9	0	7	9	9	
12	2	49	29	4	3	24	29	8	6	53	13	1	7	22	13	2	7	40	9	2	8	10	9	
13	3	58	30	2	4	30	30	8	7	49	13	4	8	14	13	7	8	40	9	5	9	7	9	
14	—	—	—	—	—	—	—	—	8	35	13	10	8	56	14	0	9	32	9	8	9	55	9	
15	—	—	—	—	—	—	—	—	2	9	16	14	3	9	35	14	5	10	16	9	11	10	33	10
16	—	—	—	—	—	—	—	—	10	9	53	14	7	10	11	14	11	10	50	10	2	11	7	10
17	—	—	—	—	—	—	—	—	8	10	28	14	9	10	44	14	11	11	25	10	4	11	42	10
18	—	—	—	—	—	—	—	—	11	10	59	15	0	11	13	15	0	11	59	10	5	—	—	—
19	—	—	—	—	—	—	—	—	3	11	29	15	0	11	47	15	0	0	16	10	5	0	33	10
20	—	—	—	—	—	—	—	—	2	—	—	—	—	0	6	15	0	0	50	10	4	1	8	10
21	—	—	—	—	—	—	—	—	8	0	25	14	11	0	45	14	0	1	27	10	2	1	46	10
22	—	—	—	—	—	—	—	—	10	1	6	14	7	1	28	14	5	2	7	10	0	2	28	9
23	—	—	—	—	—	—	—	—	7	1	51	14	3	2	15	14	0	2	50	9	10	3	14	9
24	—	—	—	—	—	—	—	—	3	2	40	13	10	3	8	13	7	3	39	9	7	4	7	9
25	—	—	—	—	—	—	—	—	9	3	40	13	5	4	13	13	4	4	38	9	4	5	10	9
26	—	—	—	—	—	—	—	—	6	4	50	13	4	5	27	13	5	5	43	9	3	6	16	9
27	—	—	—	—	—	—	—	—	4	6	1	13	8	6	35	13	11	6	48	9	5	7	21	9
28	—	—	—	—	—	—	—	—	1	7	9	14	3	7	40	14	7	7	55	9	10	8	30	10
29	—	—	—	—	—	—	—	—	4	8	11	15	0	8	39	15	5	9	5	10	4	9	37	10
30	—	—	—	—	—	—	—	—	5	9	4	15	10	9	29	16	3	10	4	10	9	10	28	11
31	—	—	—	—	—	—	—	—	9	9	55	16	6	10	20	16	9	10	52	11	3	11	16	11
8ft. 0in.										5ft. 6in.														

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.
4 51	Sub.	17	5 48	Sub.	25	6 1
5 0		18	5 53		26	6 1
5 8		19	5 58		27	6 1
5 16		20	6 2		28	6 1
5 23		21	6 5		29	6 1
5 30		22	6 8		30	6 1
5 37		23	6 10		31	6
5 43		24	6 12			

for Mean Time at Place; if Greenwich or Railway Time be re
 HOLYHEAD add 18 m. 1 KINGSTOWN subtract 1 m. for Du

TIDE TABLES FOR THE

JULY, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.													
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.													
M.	1	11m36	9 49	9 6	10 16	9 7	7 1	7 9	7 29	7 11	4 16	11 2	4 43	11 6																	
Tu.	2	0a39	10 41	9 8	11 6	9 9	7 54	8 0	8 19	8 2	5 10	11 8	5 36	11 10																	
W.	3	1 40	11 31	9 9	11 55	9 8	8 43	8 2	9 6	8 1	6 2	11 10	6 25	11 9																	
Th.	4	2 38	—	—	0 19	9 8	9 28	7 11	9 51	7 9	6 49	11 6	7 14	11 3																	
F.	5	3 33	0 44	9 7	1 10	9 6	10 14	7 6	10 38	7 4	7 38	11 0	8 2	10 8																	
S.	6	4 24	1 37	9 5	2 4	9 3	11 3	7 1	11 31	6 10	8 26	10 4	8 51	10 0																	
S.	7	5 12	2 31	9 1	2 58	8 11	—	—	0 3	6 7	9 18	9 8	9 48	9 4																	
M.	8	5 59	3 25	8 9	3 53	8 7	0 36	6 3	1 11	6 1	10 18	9 1	10 49	8 11																	
Tu.	9	6 45	4 21	8 5	4 50	8 4	1 47	5 11	2 24	5 10	11 21	8 9	11 54	8 8																	
W.	10	7 30	5 21	8 3	5 52	8 2	2 58	5 10	3 30	5 11	—	—	0 25	8 7																	
Th.	11	8 16	6 22	8 1	6 53	8 1	3 57	6 1	4 23	6 2	0 55	8 6	1 26	8 7																	
F.	12	9 2	7 27	8 1	7 56	8 2	4 49	6 3	5 13	6 4	1 58	8 8	2 29	8 9																	
S.	13	9 49	8 23	8 3	8 48	8 5	5 37	6 5	5 59	6 6	2 55	8 11	3 19	9 2																	
S.	14	10 36	9 10	8 7	9 31	8 8	6 19	6 7	6 41	6 8	3 39	9 4	3 58	9 7																	
M.	15	11 24	9 52	8 10	10 11	8 11	7 3	6 9	7 23	6 10	4 18	9 9	4 37	10 0																	
Tu.	16	morn.	10 28	8 11	10 46	9 0	7 42	6 11	8 1	7 0	4 55	10 2	5 14	10 3																	
W.	17	0 11	11 4	9 0	11 21	9 1	8 18	7 1	8 34	7 2	5 33	10 5	5 51	10 6																	
Th.	18	0 58	11 37	9 1	11 51	9 1	8 49	7 2	9 3	7 2	6 7	10 6	6 22	10 6																	
F.	19	1 44	—	—	0 8	9 1	9 18	7 1	9 34	7 0	6 38	10 5	6 56	10 4																	
S.	20	2 30	0 26	9 1	0 44	9 1	9 51	7 0	10 8	6 11	7 13	10 3	7 31	10 1																	
S.	21	3 15	1 3	9 1	1 23	9 0	10 25	6 10	10 45	6 9	7 49	10 0	8 9	9 10																	
M.	22	4 1	1 45	9 0	2 8	8 11	11 6	6 7	11 31	6 5	8 29	9 8	8 51	9 6																	
Tu.	23	4 48	2 31	8 10	2 56	8 9	—	—	0 1	6 3	9 16	9 4	9 45	9 2																	
W.	24	5 36	3 22	8 7	3 50	8 6	0 33	6 1	1 8	6 0	10 16	9 0	10 49	8 11																	
Th.	25	6 27	4 21	8 5	4 52	8 5	1 46	5 11	2 24	5 11	11 22	8 10	11 57	8 11																	
F.	26	7 20	5 24	8 4	5 57	8 4	3 1	6 0	3 35	6 3	—	—	0 31	8 11																	
S.	27	8 18	6 31	8 4	7 7	8 5	4 5	6 6	4 34	6 8	1 5	9 1	1 40	9 3																	
S.	28	9 18	7 42	8 7	8 13	8 9	5 1	6 10	5 28	7 1	2 15	9 6	2 45	9 10																	
M.	29	10 19	8 44	9 0	9 13	9 3	5 55	7 3	6 23	7 5	3 15	10 3	3 41	10 7																	
Tu.	30	11 21	9 40	9 5	10 6	9 7	6 51	7 8	7 18	7 10	4 6	11 0	4 31	11 4																	
W.	31	0a21	10 31	9 8	10 56	9 9	7 45	8 0	8 10	8 2	4 58	11 7	5 25	11 9																	
Half Mean Spring } Range.			4ft. 9in.								3ft. 10in.								5ft. 7in.												
Phases of the Moon.																Moon's Declination at Noon.															
			D.		H. M.							M.D.																			
New - - - - -			1		9	48	Afternoon.					1	18	N.35		9	6	S.56		17	16	S.21		25	11	N.41					
First Quarter -			8		5	31	Afternoon.					2	17	55		10	10	25		18	14	8		26	14	50					
Full - - - - -			16		7	56	Afternoon.					3	16	0		11	13	24		19	11	17		27	17	8					
Last Quarter -			24		2	32	Afternoon.					4	13	3		12	15	47		20	7	55		28	18	22					
New - - - - -			31		4	43	Morning.					5	9	23		13	17	28		21	4	9		29	18	20					
In Perigee - -			1		3	0	Afternoon.					6	5	18		14	18	24		22	0	8		30	17	0					
In Apogee - -			14		8	0	Afternoon.					7	1	5		15	18	31		23	3	N.58		31	14	31					
In Perigee - -			29		12	0	Midnight.					8	3	S.3		16	17	49		24	7	59									

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 2 m.



AUGUST, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST								DEVONPORT.								PORTSMOUTH.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.					
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Th.	1	12 18	4	17	20	3	4	40	20	4	6	14	15	11	6	39	16	7	—	—	—	—	0	13	13	—	—	—	—
F.	2	2 12	5	2	20	4	5	24	20	2	7	3	16	0	7	22	16	6	0	38	13	3	1	2	13	—	—	—	—
S.	3	3 3	5	44	19	10	6	6	19	4	7	42	15	8	8	3	16	0	1	25	13	1	1	46	13	—	—	—	—
S.	4	3 52	6	27	18	11	6	49	18	3	8	24	15	2	8	43	15	3	2	7	12	10	2	28	12	—	—	—	—
M.	5	4 39	7	10	17	6	7	32	16	9	9	0	14	6	9	16	14	4	2	50	12	3	3	11	12	—	—	—	—
Tu.	6	5 26	7	54	16	0	8	16	15	3	9	35	13	8	9	56	13	4	3	32	11	8	3	53	11	—	—	—	—
W.	7	6 12	8	41	14	7	9	7	14	0	10	16	12	9	10	40	12	6	4	14	11	0	4	38	10	—	—	—	—
Th.	8	6 58	9	37	13	7	10	12	13	4	11	5	12	1	11	35	11	10	5	3	10	3	5	31	10	—	—	—	—
F.	9	7 45	10	49	13	2	11	28	13	3	—	—	—	—	0	11	11	10	6	4	9	10	6	38	9	—	—	—	—
S.	10	8 32	—	—	—	—	0	7	13	5	0	47	11	9	1	26	12	0	7	16	9	9	7	54	9	—	—	—	—
S.	11	9 19	0	41	13	9	1	13	14	2	2	2	12	0	2	40	13	1	8	30	10	2	9	4	10	—	—	—	—
M.	12	10 7	1	39	14	8	2	1	15	3	3	11	12	7	3	40	13	4	9	30	10	8	9	55	10	—	—	—	—
Tu.	13	10 54	2	23	15	9	2	42	16	4	4	5	13	3	4	28	14	0	10	18	11	2	10	38	11	—	—	—	—
W.	14	11 41	3	2	16	11	3	21	17	5	4	50	13	10	5	11	14	7	10	58	11	8	11	17	11	—	—	—	—
Th.	15	morn.	3	38	17	9	3	55	18	1	5	31	14	3	5	48	15	0	11	34	12	0	11	50	12	—	—	—	—
F.	16	0 28	4	12	18	3	4	30	18	6	6	6	14	8	6	24	15	4	—	—	—	—	0	8	12	—	—	—	—
S.	17	1 14	4	46	18	7	5	2	18	8	6	43	14	10	6	59	15	5	0	27	12	4	0	45	12	—	—	—	—
S.	18	2 0	5	19	18	9	5	36	18	8	7	14	14	11	7	30	15	3	1	2	12	5	1	19	12	—	—	—	—
M.	19	2 46	5	54	18	7	6	12	18	4	7	47	14	9	8	6	14	11	1	37	12	5	1	55	12	—	—	—	—
Tu.	20	3 34	6	32	18	0	6	52	17	7	8	24	14	5	8	41	14	6	2	13	12	4	2	33	12	—	—	—	—
W.	21	4 23	7	12	17	1	7	36	16	7	8	59	14	1	9	18	13	11	2	53	12	0	3	13	11	—	—	—	—
Th.	22	5 15	8	2	16	0	8	29	15	4	9	42	13	8	10	6	13	4	3	36	11	7	4	0	11	—	—	—	—
F.	23	6 9	8	57	15	0	9	32	14	8	10	34	13	1	11	6	12	11	4	26	11	0	4	53	10	—	—	—	—
S.	24	7 6	10	12	14	7	10	55	14	8	11	41	12	10	—	—	—	—	5	26	10	6	6	4	10	—	—	—	—
S.	25	8 5	11	38	14	11	—	—	—	—	0	22	12	8	1	5	13	0	6	44	10	5	7	26	10	—	—	—	—
M.	26	9 5	0	19	15	5	0	56	16	1	1	48	13	1	2	29	13	10	8	7	10	11	8	47	11	—	—	—	—
Tu.	27	10 4	1	29	16	10	1	59	17	8	3	7	13	10	3	41	14	9	9	21	11	9	9	53	12	—	—	—	—
W.	28	11 2	2	26	18	6	2	51	19	3	4	12	14	8	4	41	15	8	10	22	12	6	10	47	12	—	—	—	—
Th.	29	11 57	3	15	19	10	3	37	20	2	5	7	15	4	5	32	16	2	11	11	13	0	11	33	13	—	—	—	—
F.	30	0 50	3	59	20	4	4	21	20	5	5	56	15	9	6	19	16	6	11	55	13	4	—	—	—	—	—	—	—
S.	31	1 41	4	42	20	5	5	2	20	3	6	41	16	0	7	1	16	5	0	18	13	4	0	40	13	—	—	—	—

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
First Quarter-	7	7	9	Morning.
Full - - - - -	15	10	37	Morning.
Last Quarter -	22	9	22	Afternoon.
New - - - - -	29	1	5	Afternoon.
In Apogee - -	11	6	0	Morning.
In Perigee - -	27	2	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	11	N. 6	9	16	S. 56	17	5	S. 9	25	18	N. 25
2	7	6	10	18	6	18	1	10	26	17	30
3	2	50	11	18	28	19	2	N. 56	27	15	37
4	1	S. 27	12	18	2	20	6	57	28	12	30
5	5	32	13	16	47	21	10	42	29	8	53
6	9	14	14	14	47	22	13	57	30	4	47
7	12	26	15	12	6	23	16	28	31	0	20
8	15	1	16	8	51	24	18	0			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, —
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

AUGUST, 1867.

MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C. A.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	
1	11 46 19	8	—	—	1 0 16	7	1 25 16	9	2 31 19	6	2 55 19	9	1
2	0 12 19	9	0 36 19	9	1 49 16	10	2 12 16	10	3 18 19	11	3 41 20	0	2
3	1 0 19	7	1 23 19	5	2 34 16	9	2 54 16	8	4 3 20	0	4 25 19	11	3
4	1 46 19	1	2 8 18	9	3 14 16	5	3 35 16	2	4 46 19	8	5 7 19	5	4
5	2 20 18	2	2 52 17	9	3 57 15	10	4 19 15	6	5 27 19	1	5 48 18	9	5
6					4 41 15	1	5 2 14	8	6 12 18	4	6 33 17	11	6
7					5 25 14	3	5 49 13	11	6 58 17	5	7 20 17	0	7
8					6 15 13	6	6 45 13	2	7 45 16	7	8 14 16	2	8
9					7 17 12	11	7 53 12	10	8 47 15	11	9 23 15	8	9
10					8 30 12	10	9 7 13	0	9 58 15	6	10 34 15	6	10
11					9 45 13	2	10 18 13	5	11 12 15	7	11 42 15	9	11
12					10 48 13	8	11 13 13	11	—	—	0 17 16	0	12
1					11 35 14	2	11 56 14	5	0 42 16	4	1 5 16	8	1
2					—	—	0 16 14	9	1 25 17	0	1 46 17	3	2
3					0 35 15	0	0 54 15	3	2 6 17	8	2 25 17	11	3
4					1 11 15	5	1 27 15	7	2 42 18	2	2 57 18	5	4
5					1 44 15	9	2 1 15	9	3 13 18	8	3 31 18	10	5
6					2 17 15	10	2 33 15	10	3 47 18	11	4 3 19	0	6
7					2 49 15	10	3 6 15	10	4 20 19	0	4 37 19	0	7
8					3 24 15	9	3 42 15	7	4 55 18	11	5 15 18	9	8
9					4 2 15	5	4 22 15	2	5 34 18	7	5 52 18	4	9
10					4 43 14	10	5 6 14	7	6 14 18	1	6 37 17	9	10
11					5 33 14	3	6 2 13	11	7 1 17	5	7 32 17	12	11
12					6 34 13	9	7 11 13	6	8 4 16	10	8 40 16	7	12
1					7 53 13	6	8 36 13	8	9 21 16	5	10 3 16	5	1
2					9 17 13	11	9 56 14	4	10 43 16	7	11 24 16	10	2
3					10 31 14	9	11 3 15	2	11 59 17	—	—	—	3
4					11 32 15	6	11 59 15	11	0 31 17	8	1 0 18	2	4
5					—	—	0 24 16	3	1 29 18	7	1 53 19	1	5
6					0 48 16	7	1 10 16	9	2 15 19	5	2 40 19	9	6
7					1 32 16	11	1 53 16	11	3 0 19	11	3 20 20	0	7
8 ft. 0 in.									9 ft. 7 in.				

Equation of Time at Noon.

L. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	St.
5 19		17	3 56		25	2 0	St
5 11		18	3 49		26	1 44	
5 3		19	3 30		27	1 27	
4 52		20	3 16		28	1 10	
4 42		21	3 2		29	0 53	
4 31		22	2 47		30	0 35	
4 20		23	2 32		31	0 17	
4 8		24	2 16				

Mean Time at Place; if Greenwich or Railway Time be required, add or subtract 5 m. SHEERNESS subtract 5 m. LONDON 5 m.

AUGUST, 1867.

Month Day.	NORTH SHIELDS.								LEITH.								THURSO.								C's Age at Noon.	
	Morning.				Afternoon.				Morning.				Afternoon.				Morning.				Afternoon.					
	Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.				D.
1	3 49	13	11		4 13	14	0		2 47	17	1		3 9	17	2		8 57	14	1		9 20	14	1			1.3
2	4 36	14	0		4 59	13	10		3 31	17	2		3 54	17	0		9 43	14	0		10 6	13	9			2.3
3	5 22	13	8		5 44	13	5		4 16	16	10		4 38	16	7		10 28	13	6		10 51	13	2			3.3
4	6 6	13	2		6 28	12	11		5 0	16	3		5 22	15	11		11 14	12	9		11 37	12	3			4.3
5	6 50	12	6		7 13	12	1		5 45	15	6		6 9	15	0		—	—			0 1	11	10			5.3
6	7 40	11	8		8 1	11	3		6 33	14	11		6 57	14	0		0 24	11	4		0 48	10	11			6.3
7	8 27	10	9		8 55	10	4		7 21	13	7		7 49	13	1		1 13	10	5		1 40	10	1			7.3
8	9 26	10	0		10 1	9	9		8 20	12	9		8 53	12	5		2 11	9	8		2 45	9	5			8.3
9	10 35	9	8		11 10	9	8		9 29	12	3		10 4	12	3		3 23	9	2		4 2	9	1			9.3
10	11 45	9	9		—	—			10 39	12	3		11 13	12	5		4 39	9	0		5 15	9	1			10.3
11	0 20	9	11		0 51	10	1		11 44	12	8		—	—			5 46	9	3		6 15	9	7			11.3
12	1 19	10	4		1 42	10	7		0 14	12	11		0 36	13	3		6 37	10	0		6 57	10	5			12.3
13	2 3	10	10		2 23	11	2		0 57	13	8		1 18	14	0		7 15	10	11		7 32	11	4			13.3
14	2 42	11	6		3 1	11	10		1 38	14	5		1 58	14	10		7 48	11	9		8 5	12	2			14.3
15	3 18	12	2		3 34	12	4		2 16	15	2		2 33	15	5		8 21	12	5		8 37	12	8			15.3
16	3 51	12	7		4 8	12	9		2 49	15	8		3 5	15	10		8 53	12	9		9 10	12	10			16.3
17	4 25	12	11		4 42	12	11		3 21	15	11		3 37	15	11		9 26	12	11		9 43	12	11			17.3
18	4 59	12	10		5 16	12	10		3 53	15	11		4 10	15	10		10 1	12	10		10 19	12	9			18.3
19	5 34	12	9		5 53	12	8		4 29	15	9		4 48	15	8		10 38	12	7		10 58	12	5			19.3
20	6 13	12	6		6 33	12	5		5 7	15	6		5 27	15	4		11 19	12	2		11 41	11	11			20.3
21	6 54	12	2		7 15	11	11		5 49	15	1		6 12	14	9		—	—			0 4	11	7			21.3
22	7 40	11	7		8 9	11	2		6 37	14	5		7 4	14	0		0 29	11	3		0 56	10	11			22.3
23	8 41	10	9		9 15	10	7		7 36	13	11		8 9	13	5		1 26	10	7		2 0	10	4			23.3
24	9 54	10	6		10 35	10	5		8 46	13	2		9 29	13	1		2 38	10	1		3 23	10	0			24.3
25	11 15	10	7		11 54	10	10		10 9	13	3		10 47	13	5		4 7	10	0		4 48	10	2			25.3
26	—	—	—		0 30	11	2		11 23	13	11		11 57	14	3		5 25	10	5		5 58	10	11			26.3
27	1 2	11	6		1 32	11	11		—	—			0 26	14	9		6 27	11	6		6 52	12	2			27.3
28	2 0	12	4		2 26	12	10		0 54	15	4		1 22	15	11		7 16	12	9		7 37	13	1			28.3
29	2 50	13	3		3 12	13	8		1 47	16	5		2 10	16	10		7 58	13	10		8 19	14	1			29.3
30	3 33	13	11		3 55	14	0		2 32	17	1		2 52	17	3		8 40	14	2		9 1	14	3			30.3
31	4 16	14	1		4 38	14	0		3 12	17	3		3 33	17	2		9 22	14	2		9 43	14	0			31.3
Half Moon Spring } 6th. 8th. 8th. 2in. 6th. 7th.																										

Half Moon Spring } 6th. 8th.

8th. 2in.

6th. 7th.

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	5	9	5	19	17	3	56	25	2	0		
2	6	1	10	5	11	18	3	43	26	1	44		
3	5	57	11	5	3	19	3	30	27	1	27		
4	5	52	12	4	52	20	3	16	28	1	10		
5	5	47	13	4	42	21	3	2	29	0	53		
6	5	41	14	4	31	22	2	47	30	0	35		
7	5	34	15	4	20	23	2	32	31	0	17		
8	5	27	16	4	8	24	2	16					

The following Table of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for

S. S. M.

Leith add 13 m.

Thurso add 14 m.

AUGUST, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height F. I.	Time. H. M. F. I.	Height F. I.	Time. H. M. F. I.	Height F. I.	Time. H. M. F. I.	Height F. I.	Time. H. M. F. I.	Height F. I.	Time. H. M. F. I.	Height F. I.	
	1	7 27 39 2		7 51 39 5	10 42 16 10	11 3 16 10	11 40 11 5	—	—	1'3				
	2	8 13 39 4		8 33 39 1	11 25 16 9	11 47 16 8	0 4 11 5	0 27 11 4	2'3					
	3	8 53 38 8		9 13 38 0	—	0 9 16 5	0 50 11 3	1 12 11 1	3'3					
	4	9 32 37 4		9 52 36 4	0 32 16 1	0 56 15 9	1 35 10 10	1 57 10 8	4'3					
	5	10 10 35 2		10 27 34 1	1 19 15 4	1 43 14 10	2 20 10 5	2 43 10 2	5'3					
	6	10 44 32 11		11 2 31 8	2 6 14 5	2 29 14 0	3 5 9 11	3 28 9 8	6'3					
	7	11 23 30 6		11 48 29 5	2 54 13 6	3 21 13 1	3 52 9 5	4 20 9 2	7'3					
	8	—		0 17 28 7	3 52 12 9	4 26 12 5	4 50 8 11	5 21 8 9	8'3					
	9	0 49 28 0		1 24 27 8	5 2 12 1	5 37 12 3	5 53 8 8	6 26 8 8	9'3					
	10	2 2 27 8		2 41 28 0	6 12 12 4	6 47 12 6	6 59 8 9	7 34 8 11	10'3					
	11	3 18 28 6		3 55 29 1	7 18 12 8	7 47 12 11	8 6 9 0	8 38 9 2	11'3					
	12	4 25 29 11		4 53 30 10	8 11 13 3	8 33 13 7	9 4 9 4	9 29 9 6	12'3					
	13	5 19 31 9		5 43 32 8	8 53 13 11	9 12 14 3	9 52 9 8	10 11 9 11	13'3					
	14	6 6 33 6		6 27 34 2	9 31 14 7	9 49 14 10	10 29 10 1	10 46 10 3	14'3					
	15	6 46 34 9		7 4 35 3	10 6 15 1	10 22 15 3	11 2 10 5	11 19 10 7	15'3					
	16	7 22 35 10		7 40 36 4	10 37 15 5	10 53 15 7	11 36 10 8	11 53 10 9	16'3					
	17	7 56 36 6		8 12 36 8	11 8 15 8	11 23 15 8	—	0 10 10 9	17'3					
	18	8 28 36 9		8 45 36 10	11 41 15 8	12 0 15 8	0 27 10 9	0 44 10 9	18'3					
	19	9 2 36 8		9 19 36 5	—	0 20 15 7	1 3 10 8	1 23 10 7	19'3					
	20	9 36 36 0		9 53 35 4	0 40 15 5	1 1 15 2	1 42 10 5	2 2 10 4	20'3					
	21	10 11 34 7		10 29 33 9	1 23 14 11	1 45 14 7	2 23 10 2	2 45 10 0	21'3					
	22	10 49 32 10		11 12 31 10	2 10 14 3	2 37 14 0	3 9 9 10	3 36 9 8	22'3					
	23	11 38 31 1		—	3 7 13 8	3 41 13 4	4 6 9 6	4 39 9 4	23'3					
	24	0 12 30 4		0 49 29 11	4 19 13 2	5 2 13 2	5 16 9 2	5 53 9 1	24'3					
	25	1 30 30 0		2 12 30 5	5 42 13 3	6 21 13 6	6 30 9 3	7 8 9 5	25'3					
	26	2 54 31 2		3 37 32 3	6 57 13 10	7 30 14 3	7 45 9 8	8 21 9 11	26'3					
	27	4 17 33 6		4 53 34 10	8 1 14 9	8 30 15 3	8 54 10 2	9 27 10 5	27'3					
	28	5 26 36 1		5 55 37 2	8 55 15 9	9 20 16 1	9 55 10 8	10 18 10 11	28'3					
	29	6 22 38 1		6 46 38 8	9 43 16 6	10 5 16 9	10 40 11 2	11 2 11 4	29'3					
	30	7 9 39 2		7 31 39 6	10 25 16 10	10 44 16 11	11 23 11 6	11 44 11 6	30'3					
	31	7 52 39 6		8 12 39 3	11 4 16 11	11 24 16 9	—	0 6 11 5	31'3					
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	6 5		9	5 19		17	3 56		25	2 0	
2	6 1		10	5 11		18	3 43		26	1 44	
3	5 57		11	5 2		19	3 30		27	1 27	
4	5 52		12	4 52		20	3 16		28	1 10	
5	5 47		13	4 42		21	3 2		29	0 53	
6	5 41		14	4 31		22	2 47		30	0 35	
7	5 34		15	4 20		23	2 32		31	0 17	
8	5 27		16	4 8		24	2 16				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

AUGUST, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.					
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		
Th.	1	12 18	11 19	9 9	11 41	9 9	8 32	8 2	8 53	8 2	5 49	11 10	6 11	11 10		
F.	2	2 12	—	—	0 3	9 9	9 14	8 1	9 34	7 11	6 33	11 9	6 55	11 7		
S.	3	3 3	0 26	9 8	0 48	9 7	9 54	7 9	10 14	7 7	7 17	11 4	7 38	11 0		
Th.	4	3 52	1 11	9 6	1 34	9 5	10 36	7 4	10 58	7 1	7 59	10 8	8 21	10 3		
F.	5	4 39	1 58	9 3	2 23	9 1	11 22	6 10	11 50	6 6	8 44	9 11	9 7	9 7		
Tu.	6	5 26	2 48	8 11	3 12	8 8	—	—	0 19	6 2	9 33	9 3	10 0	8 18		
W.	7	6 12	3 37	8 6	4 2	8 4	0 50	5 11	1 24	5 9	10 30	8 7	11 1	8 4		
Th.	8	6 58	4 31	8 2	5 2	8 1	2 1	5 7	2 37	5 6	11 34	8 3	—	—		
F.	9	7 45	5 34	8 0	6 7	7 11	3 12	5 7	3 45	5 8	0 7	8 2	0 41	8 1		
S.	10	8 32	6 43	7 10	7 20	7 11	4 16	5 9	4 46	5 11	1 17	8 1	1 53	8 3		
Th.	11	9 19	7 52	8 0	8 22	8 1	5 12	6 0	5 36	6 2	2 25	8 5	2 54	8 8		
F.	12	10 7	8 45	8 3	9 7	8 6	5 57	6 3	6 17	6 5	3 16	8 11	3 37	9 2		
Tu.	13	10 54	9 28	8 8	9 48	8 10	6 38	6 7	6 58	6 9	3 55	9 6	4 14	9 9		
W.	14	11 41	10 7	8 11	10 25	9 1	7 19	6 11	7 39	7 1	4 33	10 1	4 52	10 4		
Th.	15	morn.	10 42	9 2	10 58	9 2	7 56	7 2	8 12	7 4	5 10	10 6	5 27	10 9		
F.	16	0 28	11 14	9 3	11 30	9 3	8 27	7 5	8 43	7 6	5 44	10 10	6 1	10 12		
S.	17	1 14	11 46	9 4	—	—	8 58	7 6	9 13	7 6	6 16	11 0	6 32	10 18		
Th.	18	2 0	0 2	9 4	0 20	9 4	9 29	7 5	9 46	7 4	6 50	10 11	7 8	10 10		
F.	19	2 46	0 39	9 4	0 58	9 3	10 3	7 3	10 21	7 2	7 27	10 8	7 45	10 3		
Tu.	20	3 34	1 18	9 3	1 40	9 2	10 41	7 0	11 1	6 10	8 4	10 3	8 24	10 0		
W.	21	4 23	2 3	9 1	2 26	8 11	11 26	6 8	11 56	6 5	8 46	9 9	9 11	9 0		
Th.	22	5 15	2 52	8 10	3 19	8 8	—	—	0 30	6 2	9 42	9 3	10 15	9 0		
F.	23	6 9	3 49	8 6	4 21	8 5	1 8	6 0	1 47	5 11	10 50	8 10	11 28	8 9		
S.	24	7 6	4 57	8 4	5 34	8 3	2 31	5 11	3 12	6 0	—	—	0 7	8 9		
Th.	25	8 5	6 12	8 3	6 53	8 3	3 48	6 3	4 22	6 6	0 46	8 10	1 26	9 0		
F.	26	9 5	7 31	8 5	8 5	8 7	4 52	6 8	5 30	6 11	2 3	9 3	2 37	9 7		
Tu.	27	10 4	8 35	8 10	9 4	9 1	5 47	7 1	6 14	7 4	3 6	10 0	3 32	10 5		
W.	28	11 2	9 31	9 4	9 56	9 6	6 42	7 7	7 8	7 9	3 57	10 10	4 22	11 2		
Th.	29	11 57	10 19	9 8	10 41	9 9	7 33	7 11	7 55	8 1	4 46	11 6	5 9	11 9		
F.	30	0 50	11 2	9 9	11 22	9 9	8 15	8 3	8 35	8 3	5 31	11 11	5 52	12 0		
S.	31	1 41	11 42	9 9	—	—	8 54	8 2	9 13	8 1	6 12	11 11	6 32	11 9		
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.					
Phases of the Moon.							Moon's Declination at Noon.									
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	
First Quarter	7	7	9	Morning.	1	11	N. 6	9	16	S. 56	17	5	S. 9	25	18	
Full - - - - -	15	10	37	Morning.	2	7	6	10	18	6	18	1	10	26	17	
Last Quarter -	22	9	22	Afternoon.	3	2	50	11	18	28	19	2	N. 56	27	15	
New - - - - -	29	1	5	Afternoon.	4	1	S. 27	12	18	2	20	6	57	28	12	
							5	5	32	13	16	47	21	10	42	29
In Apogee - -	11	6	0	Morning.	6	9	14	14	14	47	22	13	57	30	4	
In Perigee - -	27	2	0	Morning.	7	12	26	15	12	6	23	16	28	31	0	
							8	15	1	16	8	51	24	18	0	

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, - for
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

AUGUST, 1867.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D
1	1	5 7 15 9		5 31 15 10		5 33 12 4		5 58 12 5		5 54 13 0		6 18 13 1		1.3
2	2	5 54 15 9		6 16 15 7		6 21 12 5		6 42 12 3		6 41 13 1		7 4 13 0		2.3
3	3	6 38 15 4		7 0 14 11		7 3 12 2		7 25 11 11		7 24 12 11		7 45 12 9		3.3
4	4	7 22 14 7		7 45 14 1		7 46 11 7		8 7 11 3		8 5 12 6		8 26 12 3		4.3
5	5	8 8 13 7		8 30 13 0		8 27 11 0		8 46 10 8		8 46 11 11		9 4 11 8		5.3
6	6	8 53 12 5		9 16 11 10		9 6 10 3		9 27 9 11		9 22 11 3		9 41 10 11		6.3
7	7	9 41 11 5		10 10 10 11		9 48 9 7		10 12 9 3		10 5 10 7		10 33 10 2		7.3
8	8	10 42 10 8		11 17 10 6		10 41 9 1		11 15 8 11		11 3 9 11		11 34 9 8		8.3
9	9	11 53 10 6		— — — —		11 50 8 10		— — — —		— — — —		0 7 9 6		9.3
10	10	0 29 10 6		1 4 10 8		0 27 8 10		1 5 8 11		0 40 9 7		1 15 9 8		10.3
11	11	1 36 10 11		2 5 11 3		1 42 9 1		2 16 9 3		1 50 9 10		2 26 10 11		11.3
12	12	2 28 11 7		2 51 11 11		2 43 9 6		3 8 9 9		2 55 10 4		3 23 10 7		12.3
13	13	3 13 12 3		3 33 12 8		3 32 10 0		3 54 10 4		3 48 10 10		4 12 11 1		13.3
14	14	3 53 13 0		4 12 13 4		4 15 10 7		4 35 10 10		4 35 11 4		4 57 11 6		14.3
15	15	4 29 13 8		4 45 13 11		4 53 11 0		5 10 11 2		5 15 11 8		5 33 11 10		15.3
16	16	5 2 14 2		5 20 14 5		5 28 11 4		5 46 11 5		5 49 12 0		6 7 12 1		16.3
17	17	5 36 14 6		5 53 14 6		6 3 11 6		6 20 11 7		6 24 12 2		6 41 12 3		17.3
18	18	6 11 14 6		6 29 14 6		6 37 11 7		6 55 11 7		6 58 12 4		7 16 12 4		18.3
19	19	6 48 14 4		7 7 14 2		7 13 11 6		7 32 11 4		7 34 12 4		7 52 12 3		19.3
20	20	7 27 13 11		7 48 13 8		7 51 11 2		8 10 11 0		8 10 12 2		8 28 12 0		20.3
21	21	8 10 13 4		8 34 12 10		8 28 10 10		8 49 10 6		8 47 11 10		9 6 11 7		21.3
22	22	9 1 12 5		9 29 11 11		9 13 10 3		9 37 10 0		9 27 11 3		9 53 11 0		22.3
23	23	10 0 11 8		10 36 11 6		10 3 9 9		10 36 9 7		10 23 10 9		10 58 10 6		23.3
24	24	11 17 11 5		11 58 11 7		11 15 9 6		11 56 9 6		11 34 10 4		— — — —		24.3
25	25	— — — —		0 38 11 10		— — — —		0 37 9 8		0 11 10 3		0 49 10 5		25.3
26	26	1 15 12 2		1 48 12 8		1 18 9 11		1 59 10 3		1 27 10 8		2 8 11 0		26.3
27	27	2 18 13 3		2 49 13 9		2 34 10 7		3 7 11 0		2 47 11 5		3 22 11 9		27.3
28	28	3 17 14 3		3 42 14 9		3 37 11 5		4 4 11 9		3 55 12 2		4 24 12 6		28.3
29	29	4 6 15 2		4 28 15 6		4 29 12 0		4 52 12 3		4 51 12 9		5 15 12 11		29.3
30	30	4 49 15 9		5 11 15 10		5 15 12 5		5 37 12 5		5 37 13 0		5 58 13 1		30.3
31	31	5 32 15 10		5 53 15 8		5 59 12 5		6 20 12 4		6 20 13 2		6 41 13 1		31.3

Mean Spring Range. } 7ft. 5in. 5ft 10in. 6ft. 2in.

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
6 5	Sub.	9	5 19	Sub.	17	3 56	Sub.	25	2 0	Sub.
6 1		10	5 11		18	3 43		26	1 44	
5 57		11	5 2		19	3 30		27	1 27	
5 52		12	4 52		20	3 16		28	1 10	
5 47		13	4 42		21	3 2		29	0 53	
5 41		14	4 31		22	2 47		30	0 35	
5 34		15	4 20		23	2 32		31	0 17	
5 27		16	4 8		24	2 16				

... times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	28 30	5 22	19 11	5 40	19 7	7 19	15 9	7 38	15 11	1 2	13 2	1 22	13 0
M.	2	3 18	5 59	19 1	6 17	18 7	7 56	15 3	8 14	15 2	1 42	12 11	2 0	12 8
Tu.	3	4 5	6 35	17 10	6 53	17 1	8 31	14 7	8 46	14 3	2 18	12 5	2 36	12 1
W.	4	4 52	7 14	16 3	7 35	15 6	9 1	13 9	9 18	13 4	2 55	11 9	3 15	11 5
Th.	5	5 39	7 56	14 8	8 19	13 11	9 37	12 10	9 57	12 4	3 34	11 1	3 54	10 8
F.	6	6 26	8 48	13 4	9 20	12 11	10 21	12 2	10 47	11 8	4 17	10 4	4 44	9 11
S.	7	7 14	9 59	12 8	10 40	12 7	11 18	11 8	11 56	11 3	5 15	9 8	5 51	9 6
S.	8	8 1	11 21	12 9	—	—	—	—	0 34	11 8	6 29	9 5	7 10	9 6
M.	9	8 48	0 2	13 0	0 38	13 6	1 15	11 6	1 54	12 3	7 49	9 9	8 27	10 0
Tu.	10	9 35	1 9	14 1	1 35	14 9	2 31	12 1	3 3	13 1	9 0	10 4	9 26	10 9
W.	11	10 22	1 55	15 6	2 17	16 3	3 33	12 11	3 57	13 11	9 50	11 1	10 12	11 4
Th.	12	11 9	2 35	16 11	2 53	17 7	4 21	13 8	4 42	14 8	10 31	11 8	10 49	11 11
F.	13	11 55	3 10	18 1	3 28	18 7	5 3	14 6	5 22	15 3	11 7	12 2	11 25	12 5
S.	14	morn.	3 44	18 11	4 2	19 2	5 41	14 11	5 58	15 7	11 41	12 7	12 0	12 8
S.	15	0 43	4 19	19 5	4 37	19 7	6 16	15 4	6 35	15 10	—	—	0 17	12 10
M.	16	1 31	4 55	19 7	5 13	19 6	6 54	15 6	7 10	15 8	0 35	12 10	0 54	12 10
Tu.	17	2 20	5 30	19 4	5 48	19 2	7 27	15 4	7 45	15 4	1 13	12 10	1 31	12 9
W.	18	3 12	6 7	18 9	6 29	18 3	8 4	15 0	8 23	14 10	1 49	12 8	2 8	12 6
Th.	19	4 5	6 51	17 7	7 15	16 11	8 42	14 7	9 2	14 3	2 29	12 3	2 51	12 0
F.	20	5 1	7 40	16 3	8 8	15 6	9 26	14 0	9 52	13 6	3 15	11 9	3 39	11 5
S.	21	5 59	8 38	14 10	9 16	14 5	10 19	13 4	10 51	12 10	4 5	11 1	4 35	10 9
S.	22	6 57	10 0	14 4	10 46	14 5	11 27	12 11	—	—	5 10	10 5	5 52	10 4
M.	23	7 54	11 31	14 8	—	—	0 11	12 7	0 55	13 1	6 35	10 3	7 19	10 0
Tu.	24	8 51	0 12	15 3	0 47	15 11	1 40	12 11	2 19	13 10	8 0	10 10	8 38	11 9
W.	25	9 46	1 22	16 9	1 49	17 6	2 56	13 8	3 30	14 9	9 14	11 8	9 43	12 1
Th.	26	10 38	2 13	18 4	2 36	19 0	3 58	14 6	4 25	15 6	10 8	12 5	10 32	12 8
F.	27	11 29	2 57	19 7	3 18	19 11	4 51	15 3	5 13	16 0	10 53	12 11	11 14	13 0
S.	28	0 19	3 37	20 1	3 56	20 2	5 34	15 8	5 56	16 3	11 33	13 2	11 52	13 2
S.	29	1 7	4 16	20 1	4 35	20 0	6 16	15 10	6 36	16 2	—	—	0 13	13 2
M.	30	1 55	4 53	19 9	5 11	19 4	6 53	15 8	7 8	15 8	0 33	13 0	0 53	12 11
Half Mean Spring Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter-	5	11	31	Afternoon.	1	3	S. 55	9	17	S. 13	17	9	N. 52	25	10	N. 15
Full - - - -	14	0	33	Morning.	2	7	51	10	15	27	18	13	16	26	6	19
Last Quarter -	21	3	9	Morning.	3	11	18	11	12	59	19	15	58	27	2	2
New- - - - -	27	11	42	Afternoon.	4	14	10	12	9	53	20	17	44	28	3	S. 17
					5	16	20	13	6	16	21	18	26	29	6	23
In Apogee- -	7	10	0	Afternoon.	6	17	45	14	2	18	22	17	58	30	10	5
In Perigee- -	23	6	0	Morning.	7	18	23	15	1	N. 51	23	16	21			
					8	18	12	16	5	59	24	13	44			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	D.		
S.	1	0 36 19 8	0 58 19 5	2 13 16 10	2 33 16 9	3 42 20 1	4 2 20 0	3 0						
M.	2	1 19 19 2	1 39 18 10	2 52 16 6	3 10 16 3	4 23 19 9	4 41 19 7	4 0						
Tu.	3	1 58 18 6	2 17 17 11	3 28 16 0	3 47 15 8	5 0 19 3	5 19 18 11	5 0						
W.	4	2 36 17 4	2 56 16 9	4 5 15 3	4 24 14 10	5 37 18 6	5 56 18 0	6 0						
Th.	5	3 15 16 2	3 35 15 6	4 44 14 4	5 5 14 0	6 17 17 7	6 38 17 1	7 0						
F.	6	3 58 14 11	4 23 14 4	5 28 13 6	5 54 13 2	6 58 16 7	7 23 16 2	8 0						
S.	7	4 50 13 11	5 23 13 7	6 26 12 9	7 0 12 6	7 54 15 9	8 26 15 6	9 0						
S.	8	5 58 13 5	6 36 13 7	7 40 12 5	8 21 12 6	9 5 15 3	9 45 15 1	10 0						
M.	9	7 15 13 11	7 53 14 4	9 1 12 8	9 39 12 11	10 25 15 2	11 5 15 4	11 0						
Tu.	10	8 25 14 10	8 50 15 5	10 15 13 3	10 44 13 7	11 41 15 7	—	12 0						
W.	11	9 13 15 11	9 35 16 5	11 9 14 0	11 30 14 4	0 12 16 0	0 38 16 4	13 0						
Th.	12	9 55 16 11	10 15 17 5	11 50 14 8	—	0 59 16 10	1 20 17 3	14 0						
F.	13	10 34 17 10	10 53 18 2	0 8 15 0	0 26 15 4	1 39 17 7	1 57 18 0	15 0						
S.	14	11 13 18 6	11 32 18 9	0 44 15 7	1 2 15 10	2 13 18 4	2 31 18 8	0						
S.	15	11 50 18 11	—	1 18 16 1	1 35 16 3	2 46 19 0	3 2 19 2	17 0						
M.	16	0 9 19 1	0 29 19 2	1 51 16 4	2 8 16 4	3 21 19 5	3 37 19 6	18 0						
Tu.	17	0 49 19 1	1 9 19 0	2 26 16 4	2 43 16 4	3 55 19 7	4 14 19 6	19 0						
W.	18	1 28 18 11	1 48 18 8	3 0 16 2	3 18 16 0	4 31 19 5	4 50 19 3	20 0						
Th.	19	2 10 18 3	2 32 17 10	3 37 15 10	3 59 15 6	5 9 19 0	5 29 18 9	21 0						
F.	20	2 55 17 4	3 19 16 9	4 21 15 2	4 45 14 9	5 51 18 4	6 13 18 0	22 0						
S.	21	3 46 16 2	4 14 15 8	5 11 14 5	5 41 14 0	6 41 17 6	7 10 17 1	23 0						
S.	22	4 46 15 2	5 24 14 11	6 14 13 8	6 54 13 5	7 45 16 9	8 25 16 5	24 0						
M.	23	6 3 14 11	6 45 15 3	7 41 13 5	8 27 13 7	9 9 16 3	9 53 16 3	25 0						
Tu.	24	7 26 15 9	8 3 16 4	9 10 13 10	9 49 14 3	10 36 16 5	11 18 16 8	26 0						
W.	25	8 37 17 0	9 6 17 7	10 23 14 7	10 56 15 11	11 51 17 1	—	27 0						
Th.	26	9 32 18 1	9 57 18 7	11 22 15 6	11 46 15 10	0 21 17 7	0 50 18 1	28 0						
F.	27	10 20 19 0	10 42 19 3	—	0 9 16 2	1 15 18 6	1 39 18 11	29 0						
S.	28	11 4 19 5	11 25 19 6	0 30 16 5	0 51 16 7	1 59 19 3	2 20 19 6	0 5						
S.	29	11 47 19 6	—	1 10 16 9	1 28 16 9	2 39 19 9	2 58 19 10	1 5						
M.	30	0 8 19 5	0 28 19 3	1 47 16 8	2 6 16 7	3 18 19 10	3 37 19 9	2 5						
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	0 2	Add.	9	2 39	Add.	17	5 28	Add.	25	8 15	Add.
2	0 20		10	3 0		18	5 49		26	8 35	
3	0 39		11	3 21		19	6 10		27	8 56	
4	0 59		12	3 42		20	6 31		28	9 16	
5	1 18		13	4 3		21	6 52		29	9 35	
6	1 38		14	4 24		22	7 13		30	9 55	
7	1 58		15	4 45		23	7 34				
8	2 19		16	5 6		24	7 55				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	28 30	1 28	12 0	1 48	11 11	8 7	21 11	8 26	21 7	4 56	15 2	5 16	14 10
M.	2	3 18	2 8	11 9	2 27	11 7	8 45	21 3	9 4	20 10	5 35	14 6	5 55	14 1
Tu.	3	4 5	2 46	11 4	3 5	11 2	9 23	20 3	9 41	19 8	6 14	13 10	6 34	13 4
W.	4	4 52	3 23	10 11	3 42	10 8	9 59	19 0	10 20	18 4	6 55	12 11	7 16	12 5
Th.	5	5 39	4 1	10 5	4 20	10 2	10 42	17 9	11 8	17 1	7 37	12 0	8 1	11 6
F.	6	6 26	4 42	9 11	5 5	9 8	11 36	16 6	—	—	8 26	11 1	8 57	10 9
S.	7	7 14	5 34	9 6	6 6	9 4	0 10	15 11	0 44	15 7	9 31	10 6	10 10	10 4
S.	8	8 1	6 47	9 4	7 29	9 4	1 20	15 4	1 56	15 4	10 48	10 3	11 26	10 5
M.	9	8 48	8 9	9 5	8 46	9 7	2 33	15 7	3 8	16 0	—	—	0 1	10 8
Tu.	10	9 35	9 22	9 9	9 52	10 0	3 43	16 6	4 13	17 1	0 34	11 0	1 3	11 5
W.	11	10 22	10 18	10 3	10 40	10 6	4 38	17 8	4 58	18 3	1 28	11 10	1 51	12 3
Th.	12	11 9	11 1	10 9	11 20	11 0	5 18	18 9	5 36	19 3	2 13	12 8	2 32	13 0
F.	13	11 55	11 39	11 2	11 57	11 4	5 55	19 8	6 13	20 0	2 51	13 4	3 8	13 8
S.	14	morn.	—	—	0 15	11 6	6 31	20 5	6 48	20 9	3 24	14 0	3 41	14 3
S.	15	0 43	0 31	11 7	0 47	11 8	7 6	21 0	7 23	21 2	3 58	14 5	4 14	14 8
M.	16	1 31	1 5	11 8	1 23	11 8	7 41	21 3	8 0	21 4	4 31	14 9	4 49	14 8
Tu.	17	2 20	1 41	11 8	1 59	11 7	8 17	21 3	8 35	21 2	5 7	14 7	5 25	14 5
W.	18	3 12	2 17	11 6	2 36	11 5	8 53	20 10	9 13	20 5	5 44	14 2	6 4	13 9
Th.	19	4 5	2 55	11 3	3 16	11 1	9 34	20 0	9 56	19 6	6 27	13 7	6 50	13 3
F.	20	5 1	3 38	10 10	4 1	10 8	10 21	18 11	10 48	18 4	7 16	12 10	7 43	12 8
S.	21	5 59	4 25	10 5	4 54	10 3	11 22	17 10	11 59	17 3	8 13	12 0	8 46	11 8
S.	22	6 57	5 24	10 1	6 2	9 11	—	—	0 40	16 11	9 26	11 5	10 11	11 4
M.	23	7 54	6 48	9 11	7 35	10 0	1 20	16 9	2 0	16 11	10 53	11 5	11 33	11 8
Tu.	24	8 51	8 18	10 2	8 56	10 5	2 40	17 4	3 17	18 0	—	—	0 8	12 1
W.	25	9 46	9 31	10 8	10 5	11 0	3 52	18 8	4 24	19 5	0 42	12 6	1 15	13 1
Th.	26	10 38	10 33	11 3	10 58	11 6	4 51	20 0	5 15	27 0	1 44	13 6	2 10	13 18
F.	27	11 29	11 22	11 9	11 43	11 11	5 38	21 0	5 59	21 4	2 34	14 3	2 54	14 7
S.	28	0 19	—	—	0 4	12 0	6 20	21 6	6 40	21 9	3 13	14 10	3 32	15 0
S.	29	1 7	0 22	12 0	0 41	12 0	7 0	21 10	7 20	21 10	3 51	15 1	4 10	15 3
M.	30	1 55	1 1	11 11	1 21	11 10	7 40	21 8	7 58	21 5	4 29	15 0	4 47	14 6
Half Mean Spring } Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.			

Phases of the Moon.

	D.	H.	M.	
First Quarter -	5	11	31	Afternoon.
Full - - - - -	14	0	33	Morning.
Last Quarter -	21	3	9	Morning.
New - - - - -	27	11	42	Afternoon.
<hr/>				
In Apogee - -	7	10	0	Afternoon.
In Perigee - -	23	6	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°
1	3	8.55	9	17	8.13	17	9	N.52	25	10
2	7	51	10	15	27	18	13	16	26	6
3	11	18	11	12	59	19	15	58	27	2
4	14	10	12	9	53	20	17	44	28	25
5	16	20	13	6	16	21	18	26	29	6
6	17	45	14	2	18	22	17	58	30	10
7	18	23	15	1	N.51	23	16	21		
8	18	12	16	5	59	24	13	44		

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required -
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 3 m.

BRITISH AND IRISH PORTS.

SEPTEMBER, 1867.

WIND DIRECTION.		MONTH DAY.		NORTH SHIELDS.								LEITH.								THURSO.								C. & A.
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
				H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
Mo.	1	4	59	13	10	5	20	13	7	3	53	16	11	4	14	16	8	10	4	13	8	10	24	13	4	3		
Tu.	2	5	39	13	4	5	59	13	0	4	34	16	5	4	53	16	0	10	44	13	0	11	3	12	6	4		
W.	3	6	18	12	8	6	37	12	3	5	12	15	8	5	32	15	3	11	23	12	0	11	44	11	6	5		
Th.	4	6	56	11	10	7	18	11	5	5	52	14	9	6	14	14	2	—	—	—	—	0	6	11	0	6		
F.	5	7	41	10	11	8	6	10	4	6	36	13	8	7	0	13	1	0	28	10	6	0	52	10	0	7		
S.	6	8	33	9	11	9	7	9	7	7	28	12	8	8	1	12	3	1	18	9	7	1	52	9	2	8		
S.	7	9	43	9	4	10	21	9	3	8	35	12	0	9	16	11	10	2	28	8	11	3	10	8	9	9		
S.	8	11	0	9	3	11	39	9	5	9	55	11	10	10	32	11	11	3	53	8	8	4	32	8	8	10		
M.	9	—	—	—	—	0	15	9	8	11	8	12	2	11	41	12	6	5	9	8	10	5	43	9	1	11		
Tu.	10	0	48	9	11	1	15	10	3	—	—	—	—	0	10	12	10	6	11	9	6	6	33	10	1	12		
W.	11	1	38	10	8	1	58	11	0	0	32	13	4	0	52	13	10	6	51	10	8	7	9	11	2	13		
Th.	12	2	17	11	5	2	35	11	10	1	12	14	4	1	31	14	10	7	25	11	8	7	39	12	2	14		
F.	13	2	52	12	3	3	8	12	7	1	49	15	3	2	6	15	7	7	55	12	7	8	11	13	0	15		
S.	14	3	25	12	11	3	41	13	2	2	24	16	0	2	39	16	3	8	27	13	3	8	43	13	5	16		
S.	15	3	58	13	4	4	15	13	6	2	55	16	5	3	10	16	6	8	59	13	6	9	17	13	7	17		
M.	16	4	33	13	6	4	52	13	5	3	28	16	7	3	47	16	6	9	36	13	6	9	55	13	5	18		
Tu.	17	5	11	13	4	5	29	13	2	4	5	16	5	4	24	16	3	10	14	13	3	10	33	13	0	19		
W.	18	5	48	13	0	6	8	12	10	4	43	16	1	5	3	15	10	10	53	12	8	11	16	12	4	20		
Th.	19	6	30	12	6	6	53	12	2	5	25	15	6	5	48	15	11	11	40	11	11	—	—	—	—	21		
F.	20	7	18	11	9	7	46	11	4	6	14	14	8	6	41	14	2	0	6	11	6	0	33	11	0	22		
S.	21	8	19	10	10	8	55	10	6	7	14	13	8	7	49	13	4	1	5	10	7	1	40	10	3	23		
S.	22	9	38	10	3	10	23	10	3	8	30	13	0	9	17	12	11	2	22	10	0	3	11	9	10	24		
M.	23	11	5	10	5	11	47	10	8	10	0	13	1	10	40	13	3	3	58	9	10	4	41	10	0	25		
T.	24	—	—	—	—	0	22	11	0	11	15	13	8	11	49	14	1	5	17	10	4	5	50	10	10	26		
W.	25	0	54	11	5	1	25	11	10	—	—	—	—	0	19	14	8	6	20	11	5	6	43	12	1	27		
Th.	26	1	50	12	4	2	13	12	11	0	44	15	3	1	8	15	9	7	4	12	8	7	24	13	2	28		
F.	27	2	36	13	2	2	55	13	6	1	31	16	3	1	51	16	7	7	42	13	7	8	1	13	10	29		
S.	28	3	14	13	8	3	33	13	10	2	12	16	10	2	31	17	0	8	19	14	0	8	37	14	0	30		
S.	29	3	52	13	11	4	12	13	11	2	49	17	1	3	8	17	0	8	56	14	0	9	16	13	10	31		
M.	30	4	32	13	9	4	50	13	6	3	27	16	10	3	45	16	7	9	35	13	7	9	53	13	3	32		
Half Mean Spring Range.				6ft. 8in.								8ft. 2in.								6ft. 7in.								

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
1	0 2		9	2 39		17	5 28		25	8 15	
2	0 20		10	3 0		18	5 49		26	8 35	
3	0 39		11	3 21		19	6 10		27	8 56	
4	0 59		12	3 42		20	6 31		28	9 16	
5	1 18		13	4 3		21	6 52		29	9 35	
6	1 38		14	4 24		22	7 13		30	9 55	
7	1 58		15	4 45		23	7 34				
8	2 19		16	5 6		24	7 55				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

NORTH SHIELDS add 6 m.

LEITH add 13 m.

THURSO add 14 m.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.																				
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																
			Time.		Height.			Time.		Height.			Time.		Height.				Time.		Height.				Time.		Height.												
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.									
S.	1	28 30	1	28	10	1	1	48	10	0	0	39	27	4	0	59	27	0	7	48	21	10	8	7	21	0	8	7	21	0									
M.	2	3 18	2	7	10	0	2	25	9	10	1	17	26	6	1	35	25	11	8	26	21	0	8	45	20	6	8	45	20	6									
Tu.	3	4 5	2	43	9	8	3	1	9	6	1	53	25	3	2	11	24	5	9	3	19	9	9	20	19	0	9	20	19	0									
W.	4	4 52	3	19	9	3	3	38	9	1	2	29	23	8	2	48	22	10	9	38	18	4	9	56	17	7	9	56	17	7									
Th.	5	5 39	3	57	8	11	4	18	8	8	3	8	22	0	3	29	21	1	10	15	16	10	10	35	16	1	10	35	16	1									
F.	6	6 26	4	41	8	6	5	9	8	3	3	54	20	4	4	25	19	7	10	59	15	4	11	26	14	10	11	26	14	10									
S.	7	7 14	5	40	8	1	6	17	7	11	4	59	19	1	5	40	18	10	12	0	14	6	—	—	—	—	—	—	—	—									
S.	8	8 1	6	55	7	10	7	35	7	10	6	23	18	10	7	5	19	1	0	36	14	4	1	19	14	5	1	19	14	5									
M.	9	8 48	8	14	8	0	8	50	8	2	7	43	19	6	8	19	20	1	2	3	14	9	2	42	15	3	2	42	15	3									
Tu.	10	9 35	9	22	8	4	9	48	8	6	8	47	20	9	9	11	21	6	3	16	15	11	3	43	16	8	3	43	16	8									
W.	11	10 22	10	10	8	8	10	32	8	10	9	32	22	3	9	52	23	0	4	8	17	4	4	32	18	1	4	32	18	1									
Th.	12	11 9	10	52	9	0	11	12	9	2	10	9	23	8	10	27	24	3	4	55	18	9	5	16	19	4	5	16	19	4									
F.	13	11 55	11	32	9	4	11	51	9	6	10	45	24	9	11	3	25	3	5	36	19	10	5	55	20	4	5	55	20	4									
S.	14	morn.	—	—	—	—	0	8	9	8	11	20	25	9	11	38	26	1	6	12	20	9	6	29	21	1	6	29	21	1									
S.	15	0 43	0	26	9	9	0	44	9	10	11	55	26	4	—	—	—	—	6	46	21	4	7	3	21	6	7	3	21	6									
M.	16	1 31	1	2	9	11	1	21	9	11	0	13	26	7	0	32	26	7	7	21	21	6	7	39	21	5	7	39	21	5									
Tu.	17	2 20	1	40	9	11	1	57	9	11	0	50	26	6	1	7	26	4	7	57	21	3	8	16	21	0	8	16	21	0									
W.	18	3 12	2	14	9	10	2	34	9	9	1	25	26	0	1	43	25	6	8	36	20	8	8	57	20	2	8	57	20	2									
Th.	19	4 5	2	54	9	7	3	15	9	5	2	4	24	11	2	26	24	3	9	17	19	7	9	38	19	0	9	38	19	0									
F.	20	5 1	3	38	9	4	4	2	9	2	2	48	23	7	3	13	22	10	10	0	18	4	10	25	17	8	10	25	17	8									
S.	21	5 59	4	30	8	11	5	0	8	9	3	41	22	0	4	14	21	4	10	51	16	11	11	22	16	4	11	22	16	4									
S.	22	6 57	5	36	8	7	6	18	8	5	4	54	20	10	5	41	20	8	12	0	16	2	—	—	—	—	—	—	—	—									
M.	23	7 54	7	1	8	4	7	44	8	6	6	30	20	11	7	14	21	4	0	42	16	2	1	31	16	5	1	31	16	5									
Tu.	24	8 51	8	24	8	8	9	0	8	11	7	52	22	0	8	26	22	10	2	15	17	0	2	54	17	9	2	54	17	9									
W.	25	9 46	9	35	9	1	10	4	9	4	8	58	23	9	9	24	24	7	3	31	18	8	4	3	19	5	4	3	19	5									
Th.	26	10 38	10	30	9	6	10	55	9	8	9	48	25	4	10	10	25	11	4	31	20	2	4	58	20	10	4	58	20	10									
F.	27	11 29	11	17	9	9	11	39	9	10	10	31	26	5	10	52	26	9	5	22	21	4	5	44	21	8	5	44	21	8									
S.	28	0 19	12	0	10	0	—	—	—	—	11	12	27	0	11	32	27	2	6	4	21	11	6	23	22	0	6	23	22	0									
S.	29	1 7	0	20	10	0	0	40	10	1	11	52	27	2	—	—	—	—	6	43	22	1	7	2	21	11	7	2	21	11									
M.	30	1 55	1	0	10	0	1	19	9	11	0	12	27	0	0	30	26	9	7	20	21	8	7	37	21	9	7	37	21	9									
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.																												
Phases of the Moon.												Moon's Declination at Noon.																											
D. H. M.												M.D. ° ' "																											
First Quarter - 5 11 31 Afternoon.												1 3 8.55 9 17 S. 13 17 9 N. 52 25 10 N. 18																											
Full - - - - 14 0 33 Morning.												2 7 51 10 15 27 18 13 16 26 6 19																											
Last Quarter - 21 3 9 Morning.												3 11 18 11 12 59 19 15 58 27 2 2																											
New - - - - 27 11 42 Afternoon.												4 14 10 12 9 53 20 17 44 28 2 S. 17																											
												5 16 20 13 6 16 21 18 26 29 6 23																											
In Apogee - - 7 10 0 Afternoon.												6 17 45 14 2 18 22 17 58 30 10 5																											
In Perigee - - 23 6 0 Morning.												7 18 23 15 1 N. 51 23 16 21																											
												8 18 12 16 5 59 24 13 44																											

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. P. I.		H. M. P. I.	H. M. P. I.		H. M. P. I.		H. M. P. I.	H. M. P. I.		H. M. P. I.		D.
S.	1	8 31 38	6	8 49 38	3	11 45 16	6	—	—	0 27 11	4	0 48 11	2	3° 0
M.	2	9 6 37	7	9 23 36	10	0 5 16	3	0 25 15	11	1 8 11	0	1 28 10	9	4° 0
Tu.	3	9 39 35	8	9 55 34	6	0 46 15	6	1 6 15	0	1 47 10	6	2 6 10	3	5° 0
W.	4	10 10 33	3	10 25 32	1	1 27 14	6	1 48 14	1	2 26 10	0	2 47 9	9	6° 0
Th.	5	10 42 30	8	11 2 29	6	2 9 13	7	2 33 13	1	3 8 9	6	3 31 9	2	7° 0
F.	6	11 29 28	4	12 0 27	6	3 0 12	8	3 33 12	3	3 58 8	11	4 31 8	8	8° 0
S.	7	—	—	0 36 26	11	4 8 12	0	4 49 11	10	5 4 8	6	5 40 8	5	9° 0
S.	8	1 15 26	9	1 56 26	11	5 28 11	10	6 6 12	0	6 16 8	5	6 53 8	7	10° 0
M.	9	2 36 27	4	3 15 28	1	6 42 12	3	7 15 12	6	7 29 8	9	8 3 8	11	11° 0
Tu.	10	3 50 29	0	4 21 30	1	7 43 12	11	8 7 13	4	8 34 9	2	9 0 9	5	12° 0
W.	11	4 48 31	3	5 13 32	5	8 27 13	9	8 46 14	2	9 24 9	7	9 46 9	10	13° 0
Th.	12	5 36 33	6	5 57 34	4	9 4 14	7	9 22 15	0	10 4 10	1	10 20 10	4	14° 0
F.	13	6 17 35	2	6 37 36	1	9 39 15	4	9 56 15	7	10 36 10	6	10 53 10	9	15° 0
S.	14	6 55 36	9	7 13 37	3	10 12 15	11	10 28 16	1	11 9 10	11	11 26 11	0	16° 0
S.	15	7 30 37	10	7 47 38	1	10 43 16	3	10 59 16	3	11 43 11	1	—	—	17° 0
M.	16	8 5 38	2	8 22 38	1	11 17 16	4	11 36 16	3	0 1 11	1	0 20 11	1	18° 0
Tu.	17	8 39 38	0	8 56 37	8	11 55 16	2	—	—	0 39 11	0	0 58 10	11	19° 0
W.	18	9 14 37	1	9 33 36	4	0 15 15	11	0 36 15	8	1 17 10	9	1 37 10	7	20° 0
Th.	19	9 51 35	4	10 10 34	4	0 59 15	4	1 23 14	11	1 59 10	5	2 22 10	2	21° 0
F.	20	10 30 33	3	10 53 32	0	1 48 14	6	2 14 14	1	2 47 10	0	3 13 9	9	22° 0
S.	21	11 20 30	11	11 56 30	0	2 46 13	8	3 21 13	4	3 44 9	6	4 19 9	3	23° 0
S.	22	—	—	0 37 29	7	4 3 13	0	4 50 13	0	5 0 9	1	5 41 9	0	24° 0
M.	23	1 21 29	8	2 5 30	1	5 33 13	2	6 14 13	5	6 21 9	2	7 1 9	4	25° 0
Tu.	24	2 47 30	11	3 28 32	0	6 49 13	9	7 22 14	2	7 37 9	7	8 12 9	10	26° 0
W.	25	4 9 33	4	4 43 34	7	7 54 14	8	8 20 15	2	8 47 10	1	9 17 10	4	27° 0
Th.	26	5 12 35	10	5 39 36	11	8 43 15	7	9 4 16	0	9 42 10	8	10 5 10	11	28° 0
F.	27	6 3 37	8	6 26 38	2	9 25 16	4	9 45 16	6	10 23 11	1	10 42 11	3	29° 0
S.	28	6 46 38	7	7 4 38	10	10 4 16	8	10 22 16	9	11 1 11	4	11 20 11	4	30° 0
S.	29	7 25 39	0	7 46 38	9	10 40 16	9	10 58 16	7	11 40 11	4	12 0 11	3	31° 0
M.	30	8 3 38	5	8 20 37	10	11 16 16	5	11 34 16	2	—	—	0 19 11	1	32° 0

Half Mean Spring }
Range.

18ft. 7in.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	0 2		9	2 39		17	5 28		25	8 15	
2	0 20		10	3 0		18	5 49		26	8 35	
3	0 39		11	3 21		19	6 10		27	8 56	
4	0 59		12	3 42		20	6 31		28	9 16	
5	1 18		13	4 3		21	6 52		29	9 35	
6	1 38		14	4 24		22	7 13		30	9 55	
7	1 58		15	4 45		23	7 34				
8	2 19		16	5 6		24	7 55				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.									
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.							
S.	1	2 30	0 3	9 8	0 24	9 8	9 32	7 10	9 50	7 8	6 53	11 6	7 13	11 2															
M.	2	3 18	0 44	9 7	1 4	9 5	10 8	7 5	10 26	7 3	7 31	10 10	7 49	10 6															
Tu.	3	4 5	1 24	9 4	1 45	9 2	10 44	6 11	11 5	6 8	8 7	10 1	8 27	9 8															
W.	4	4 52	2 7	8 11	2 30	8 9	11 31	6 4	11 58	6 0	8 49	9 4	9 12	8 11															
Th.	5	5 39	2 52	8 6	3 15	8 4	—	—	0 29	5 8	9 39	8 7	10 7	8 3															
F.	6	6 26	3 41	8 2	4 12	8 0	1 1	5 6	1 41	5 4	10 42	8 0	11 17	7 11															
S.	7	7 14	4 45	7 11	5 21	7 10	2 20	5 3	2 59	5 3	11 54	7 10	—	—															
S.	8	8 1	5 58	7 9	6 37	7 9	3 35	5 5	4 10	5 7	0 32	7 9	1 11	7 10															
M.	9	8 48	7 14	7 10	7 49	7 11	4 41	5 9	5 9	5 11	1 47	8 0	2 22	8 3															
Tu.	10	9 35	8 18	8 1	8 41	8 4	5 33	6 2	5 52	6 4	2 50	8 7	3 12	8 11															
W.	11	10 22	9 2	8 6	9 22	8 9	6 12	6 7	6 32	6 9	3 31	9 4	3 49	9 5															
Th.	12	11 9	9 40	8 11	9 58	9 1	6 51	7 0	7 10	7 2	4 6	10 1	4 24	10 4															
F.	13	11 55	10 15	9 3	10 32	9 4	7 28	7 4	7 46	7 6	4 42	10 8	5 0	10 11															
S.	14	morn.	10 49	9 5	11 5	9 6	8 2	7 8	8 18	7 9	5 17	11 2	5 34	11 4															
S.	15	0 43	11 20	9 6	11 37	9 6	8 33	7 10	8 49	7 10	5 50	11 5	6 7	11 5															
M.	16	1 31	11 55	9 6	—	—	9 6	7 10	9 23	7 9	6 25	11 4	6 44	11 3															
Tu.	17	2 20	0 14	9 6	0 33	9 6	9 40	7 7	9 57	7 6	7 3	11 1	7 21	10 11															
W.	18	3 12	0 53	9 5	1 14	9 4	10 16	7 4	10 38	7 1	7 40	10 7	8 1	10 4															
Th.	19	4 5	1 38	9 3	2 3	9 1	11 2	6 10	11 32	6 7	8 23	10 0	8 49	9 5															
F.	20	5 1	2 30	8 11	2 58	8 9	—	—	0 5	6 3	9 18	9 4	9 53	9 9															
S.	21	5 59	3 28	8 6	4 1	8 5	0 44	6 0	1 27	5 11	10 30	8 9	11 12	8 8															
S.	22	6 57	4 41	8 3	5 22	8 2	2 15	5 10	3 0	5 11	11 55	8 8	—	—															
M.	23	7 54	6 3	8 2	6 46	8 3	3 39	6 2	4 15	6 5	0 37	8 8	1 19	8 10															
Tu.	24	8 51	7 23	8 4	7 57	8 6	4 45	6 7	5 13	6 10	1 56	9 2	2 29	9 6															
W.	25	9 46	8 28	8 10	8 54	9 2	5 39	7 1	6 4	7 3	2 59	9 11	3 23	10 4															
Th.	26	10 38	9 18	9 4	9 41	9 6	6 29	7 6	6 53	7 9	3 45	10 9	4 7	11 1															
F.	27	11 29	10 1	9 7	10 21	9 8	7 15	7 11	7 36	8 0	4 28	11 5	4 49	11 7															
S.	28	0 19	10 40	9 9	10 59	9 9	7 54	8 1	8 12	8 2	5 9	11 9	5 28	11 9															
S.	29	1 7	11 17	9 8	11 36	9 8	8 30	8 1	8 47	8 0	5 47	11 9	6 6	11 8															
M.	30	1 55	11 54	9 7	—	—	9 4	7 10	9 21	7 8	6 24	11 5	6 42	11 2															
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.																		
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D. ° '														
First Quarter- 5 11 31 Afternoon.															1 3 S. 55 9 17 S. 13 17 9 N. 52 25 10 N. 18														
Full - - - - 14 0 33 Morning.															2 7 51 10 15 27 18 13 16 26 6 19														
Last Quarter- 21 3 9 Morning.															3 11 18 11 12 59 19 15 58 27 2 2														
New - - - - 27 11 42 Afternoon.															4 14 10 12 9 53 20 17 44 28 2 S. 17														
															5 16 20 13 6 16 21 18 26 29 6 23														
In Apogee - - 7 10 0 Afternoon.															6 17 45 14 2 18 22 17 58 30 10 5														
In Perigee - - 23 6 0 Morning.															7 18 23 15 1 N. 51 23 16 21														
															8 18 12 16 5 59 24 13 44														

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

SEPTEMBER, 1867.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
A.	1	6	13	15	5	6	33	15	2	6	40	12	2	6	59	12	0	7	2	12	11	7	20	12	9	3.0
M.	2	6	53	14	9	7	12	14	4	7	18	11	9	7	36	11	5	7	38	12	7	7	56	12	4	4.0
Tu.	3	7	31	13	10	7	51	13	3	7	54	11	1	8	11	10	9	8	13	12	1	8	29	11	9	5.0
W.	4	8	12	12	8	8	33	12	1	8	28	10	5	8	46	10	0	8	46	11	5	9	3	11	0	6.0
Th.	5	8	56	11	5	9	26	10	11	9	6	9	7	9	27	9	3	9	21	10	8	9	42	10	3	D
F.	6	9	51	10	5	10	25	10	2	9	54	9	0	10	24	8	9	10	15	9	11	10	46	9	7	8.0
S.	7	11	4	10	0	11	44	10	0	11	2	8	7	11	41	8	6	11	21	9	4	11	57	9	3	9.0
S.	8	—	—	—	—	0	23	10	2	—	—	—	—	0	21	8	8	—	—	—	—	0	34	9	4	10.0
M.	9	0	59	10	5	1	33	10	9	1	0	8	9	1	39	8	11	1	11	9	6	1	47	9	8	11.0
Tu.	10	2	1	11	2	2	24	11	8	2	12	9	3	2	39	9	7	2	21	10	0	2	51	10	4	12.0
W.	11	2	46	12	2	3	7	12	7	3	2	9	11	3	26	10	3	3	17	10	8	3	42	11	0	13.0
Th.	12	3	26	13	1	3	44	13	6	3	46	10	7	4	6	10	11	4	5	11	4	4	26	11	7	14.0
F.	13	4	1	13	10	4	19	14	3	4	25	11	2	4	43	11	5	4	47	11	10	5	6	12	1	15.0
S.	14	4	35	14	7	4	52	14	10	5	1	11	8	5	19	11	10	5	23	12	3	5	39	12	5	○
S.	15	5	9	15	1	5	27	15	2	5	36	11	11	5	55	12	0	5	56	12	7	6	15	12	8	17.0
M.	16	5	46	15	2	6	5	15	1	6	14	12	0	6	31	12	0	6	34	12	9	6	52	12	9	18.0
Tu.	17	6	23	15	0	6	42	14	10	6	49	11	11	7	7	11	9	7	10	12	8	7	28	12	7	19.0
W.	18	7	2	14	6	7	24	14	1	7	26	11	7	7	47	11	4	7	47	12	5	8	7	12	3	20.0
Th.	19	7	47	13	8	8	12	13	2	8	8	11	0	8	28	10	9	8	26	12	0	8	46	11	9	21.0
F.	20	8	48	12	7	9	8	12	0	8	51	10	4	9	18	10	0	9	7	11	5	9	32	11	1	22.0
S.	21	9	40	11	7	10	20	11	4	9	45	9	9	10	20	9	6	10	3	10	9	10	42	10	4	⊕
S.	22	11	5	11	3	11	49	11	5	11	3	9	5	11	47	9	5	11	22	10	2	—	—	—	—	24.0
M.	23	—	—	—	—	0	31	11	8	—	—	—	—	0	30	9	7	0	2	10	2	0	41	10	4	25.0
Tu.	24	1	7	12	1	1	40	12	7	1	11	9	10	1	50	10	2	1	20	10	7	1	59	10	11	26.0
W.	25	2	11	13	2	2	39	13	8	2	27	10	6	2	57	10	11	2	38	11	4	3	12	11	8	27.0
Th.	26	3	4	14	2	3	27	14	7	3	23	11	4	3	48	11	8	3	41	12	1	4	8	12	5	28.0
F.	27	3	48	14	11	4	9	15	3	4	10	11	11	4	32	12	1	4	32	12	7	4	55	12	9	●
S.	28	4	27	15	6	4	46	15	7	4	52	12	3	5	12	12	3	5	15	12	10	5	34	12	11	0.5
S.	29	5	6	15	8	5	26	15	6	5	33	12	3	5	53	12	3	5	53	13	0	6	13	12	11	1.5
M.	30	5	45	15	3	6	3	15	0	6	11	12	1	6	29	11	11	6	32	12	9	6	51	12	8	2.5
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	0	2		9	2	39		17	5	28		25	8	15	
2	0	20		10	3	0		18	5	49		26	8	35	
3	0	39		11	3	21		19	6	10		27	8	56	
4	0	59		12	3	42		20	6	31		28	9	16	
5	1	18		13	4	3		21	6	52		29	9	35	
6	1	38		14	4	24		22	7	13		30	9	55	
7	1	58		15	4	45		23	7	34					
8	2	19		16	5	6		24	7	55					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

OCTOBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																																		
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																														
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.																													
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																													
Tu.	1	2a43	5	28	18	11	5	45	18	5	7	24	15	3	7	41	14	11	1	11	12	9	1	29	12	7																											
W.	2	3 31	6	3	17	10	6	20	17	2	7	58	14	7	8	13	14	2	1	46	12	4	2	4	12	1																											
Th.	3	4 19	6	39	16	5	6	59	15	8	8	28	13	10	8	44	13	4	2	22	11	9	2	40	11	5																											
F.	4	5 6	7	20	14	11	7	42	14	2	9	1	13	0	9	20	12	5	2	59	11	1	3	18	10	9																											
S.	5	5 54	8	6	13	5	8	33	13	0	9	40	12	3	10	6	11	7	3	40	10	5	4	3	10	1																											
S.	6	6 41	9	8	12	7	9	48	12	5	10	32	11	9	11	5	11	1	4	29	9	9	5	2	9	6																											
M.	7	7 28	10	31	12	6	11	14	12	9	11	45	11	8	—	—	—	—	5	40	9	4	6	20	9	4																											
Tu.	8	8 15	11	53	13	2	—	—	—	—	0	25	11	3	1	7	12	1	7	2	9	6	7	40	9	9																											
W.	9	9 1	0	29	13	9	0	56	14	5	1	45	11	11	2	22	12	10	8	18	10	2	8	47	10	7																											
Th.	10	9 47	1	21	15	3	1	42	16	1	2	53	12	8	3	21	13	9	9	12	10	11	9	36	11	4																											
F.	11	10 35	2	2	16	10	2	20	17	7	3	45	13	8	4	9	14	7	9	57	11	8	10	15	12	5																											
S.	12	11 23	2	37	18	3	2	55	18	11	4	30	14	6	4	51	15	4	10	33	12	4	10	52	12	7																											
S.	13	morn.	3	14	19	4	3	33	19	8	5	11	15	3	5	31	15	10	11	11	12	9	11	29	13	—																											
M.	14	0 13	3	52	19	11	4	11	20	1	5	51	15	8	6	10	16	0	11	48	13	1	—	—	—	—																											
Tu.	15	1 5	4	30	20	2	4	49	20	1	6	29	15	11	6	48	15	11	0	8	13	2	0	29	13	—																											
W.	16	1 59	5	9	19	10	5	29	19	6	7	6	15	9	7	25	15	8	0	49	13	2	1	10	13	—																											
Th.	17	2 56	5	50	19	2	6	12	18	7	7	45	15	6	8	6	15	2	1	31	12	11	1	51	12	—																											
F.	18	3 54	6	35	17	11	7	1	17	2	8	27	15	0	8	50	14	5	2	13	12	6	2	36	12	—																											
S.	19	4 52	7	29	16	4	7	58	15	7	9	15	14	4	9	42	13	7	3	2	11	10	3	28	11	—																											
S.	20	5 50	8	30	14	11	9	6	14	6	10	10	13	7	10	42	12	10	3	55	11	2	4	27	10	—																											
M.	21	6 46	9	50	14	4	10	35	14	5	11	18	13	1	—	—	—	—	5	1	10	6	5	42	10	—																											
Tu.	22	7 40	11	20	14	9	11	59	15	2	0	2	12	6	0	46	13	2	6	24	10	4	7	7	10	—																											
W.	23	8 32	—	—	—	—	0	33	15	9	1	28	12	10	2	7	13	9	7	47	10	10	8	23	11	—																											
Th.	24	9 22	1	3	16	4	1	28	17	1	2	40	13	7	3	11	14	7	8	54	11	7	9	23	11	—																											
F.	25	10 11	1	52	17	9	2	13	18	4	3	39	14	5	4	5	15	2	9	47	12	2	10	9	12	—																											
S.	26	10 59	2	33	18	11	2	54	19	3	4	28	15	1	4	51	15	8	10	29	12	7	10	50	12	—																											
S.	27	11 47	3	14	19	5	3	33	19	6	5	11	15	6	5	30	15	9	11	10	12	10	11	29	12	—																											
M.	28	0a35	3	52	19	5	4	11	19	3	5	49	15	8	6	8	15	8	11	48	12	10	—	—	—	—																											
Tu.	29	1 23	4	28	19	1	4	45	18	10	6	25	15	6	6	42	15	4	0	8	12	9	0	27	12	—																											
W.	30	2 11	5	3	18	6	5	19	18	1	6	57	15	1	7	12	14	9	0	45	12	6	1	3	12	—																											
Th.	31	2 59	5	36	17	8	5	53	17	2	7	27	14	7	7	43	14	1	1	21	12	2	1	37	12	—																											
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																																		
Phases of the Moon.																											Moon's Declination at Noon.																										
D. H. M.																											M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '																										
First Quarter- 5 6 17 Afternoon.																											1 13 8. 14 9 11 8. 5 17 17 N. 31 25 03. 50																										
Full - - - - 13 1 24 Afternoon.																											2 15 42 10 7 38 18 18 30 26 5																										
Last Quarter - 20 9 17 Morning.																											3 17 25 11 3 45 19 18 18 27 8 53																										
New - - - - 27 1 3 Afternoon.																											4 18 20 12 0 N. 25 20 16 57 28 12 10																										
																											5 18 25 13 4 40 21 14 34 29 15																										
In Apogee - - 5 5 0 Afternoon.																											6 17 42 14 8 46 22 11 23 30 17 5																										
In Perigee - - 18 3 0 Morning.																											7 16 12 15 12 27 23 7 35 31 18 10																										
																											8 13 59 16 15 26 24 3 26																										

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

OCTOBER, 1867.

West Wind.	Mortu Day.	DOVER.				SHEERNESS.				LONDON.														
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.												
		Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.	Time. H. M. P. I.	Height. F. L.											
1	0	47	19	0	1	6	18	8	2	34	16	5	2	41	16	2	3	54	19	7	4	11	19	5
2	1	25	18	3	1	44	17	11	2	58	15	11	3	15	15	7	4	29	19	2	4	46	18	10
3	2	2	17	5	2	21	16	10	3	33	15	3	3	50	14	11	5	4	18	6	5	21	18	1
4	2	40	16	3	3	0	15	8	4	9	14	6	4	29	14	0	5	40	17	8	5	58	17	2
5	3	21	15	2	3	43	14	6	4	50	13	8	5	14	13	3	6	21	16	9	6	43	16	3
6	4	8	14	0	4	38	13	7	5	40	12	11	6	11	12	7	7	10	15	10	7	42	15	6
7	5	12	13	4	5	50	13	4	6	48	12	4	7	29	12	4	8	16	15	3	8	58	15	1
8	6	29	13	7	7	7	14	0	8	12	12	5	8	53	12	8	9	29	15	1	10	20	15	3
9	7	43	14	7	8	12	15	2	9	30	13	0	10	5	13	5	10	59	15	5	11	31	15	9
10	8	36	15	9	8	59	16	4	10	32	13	10	10	55	14	3	12	0	16	3	—	—	—	—
11	9	20	16	11	9	39	17	6	11	16	14	8	11	35	15	0	0	25	16	8	0	45	17	2
12	9	59	18	0	10	19	18	5	11	52	15	5	—	—	—	1	5	17	7	1	24	18	1	—
13	10	39	18	10	11	0	19	1	0	10	15	9	0	28	16	1	1	42	18	6	1	58	18	10
14	11	21	19	4	11	42	19	6	0	47	16	4	1	5	16	6	2	17	19	2	2	33	19	6
15	—	—	—	—	0	3	19	7	1	24	16	8	1	43	16	8	2	51	19	8	3	11	19	10
16	0	24	19	7	0	46	19	5	2	1	16	8	2	20	16	7	3	31	19	11	3	50	19	10
17	1	8	19	2	1	30	18	11	2	39	16	6	2	59	16	3	4	10	19	9	4	29	19	6
18	1	53	18	7	2	17	18	1	3	19	16	0	3	42	15	9	4	50	19	3	5	12	18	11
19	2	42	17	6	3	8	16	11	4	6	15	4	4	32	14	10	5	36	18	7	6	2	18	1
20	3	36	16	3	4	6	15	8	4	59	14	5	5	31	14	1	6	30	17	7	6	59	17	2
21	4	37	15	2	5	14	14	11	6	6	13	8	6	46	13	5	7	34	16	10	8	14	16	6
22	5	52	14	1	6	33	15	3	7	31	13	5	8	16	13	7	8	59	16	4	9	43	16	3
23	—	—	—	—	—	—	—	—	8	58	13	10	9	36	14	2	10	24	16	5	11	3	16	8
24	—	—	—	—	—	—	—	—	10	9	14	6	10	37	14	11	11	37	17	1	—	—	—	—
25	—	—	—	—	—	—	—	—	11	2	15	3	11	25	15	7	0	5	17	5	0	31	17	10
26	—	—	—	—	—	—	—	—	11	46	15	10	—	—	—	0	56	18	3	1	18	18	6	
27	—	—	—	—	—	—	—	—	0	6	16	1	0	27	16	3	1	40	18	10	1	58	19	1
28	—	—	—	—	—	—	—	—	0	47	16	4	1	6	16	5	2	17	19	3	2	34	19	4
29	—	—	—	—	—	—	—	—	1	24	16	4	1	42	16	3	2	52	19	4	3	10	19	4
30	—	—	—	—	—	—	—	—	1	59	16	1	2	16	15	11	3	28	19	3	3	45	19	1
31	—	—	—	—	—	—	—	—	2	33	15	9	2	49	15	6	4	2	18	10	4	18	18	8
														8ft. 0in.				9ft. 7in.						

8ⁿ. 0ⁱⁿ.9ⁿ. 7ⁱⁿ.

Equation of Time at Noon.

s.	Add.	M. D.	M. S.	Add.	M. D.	M. S.
37		17	14 32		25	15 48
53		18	14 44		26	15 54
9		19	14 55		27	16 0
24		20	15 5		28	16 5
38		21	15 15		29	16 9
53		22	15 25		30	16 13
6		23	15 33		31	16 15
19		24	15 41			

Mean Time at Place; if Greenwich or Railway Time be required

SHEERNESS subtract 3 m.

LONDON 0 m.

OCTOBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.								
Tu.	1	28 43	1 39 11 8	1 57 11 6	8 15 21 1	8 33 20 9	5 5 14 6	5 23 14 2																		
W.	2	3 31	2 15 11 4	2 33 11 1	8 51 20 2	9 9 19 8	5 41 13 9	6 0 13 3																		
Th.	3	4 19	2 51 10 11	3 8 10 8	9 26 19 1	9 45 18 5	6 19 12 11	6 39 12 6																		
F.	4	5 6	3 26 10 5	3 45 10 2	10 5 17 10	10 27 17 3	7 1 12 1	7 23 11 7																		
S.	5	5 54	4 5 9 11	4 28 9 8	10 54 16 11	11 22 16 1	7 47 11 2	8 12 10 10																		
S.	6	6 41	4 51 9 6	5 19 9 4	11 56 15 7	— — — —	8 42 10 6	9 19 10 3																		
M.	7	7 28	5 54 9 3	6 36 9 2	0 32 15 3	1 9 15 2	9 59 10 2	10 39 10 2																		
Tu.	8	8 15	7 20 9 3	8 1 9 5	1 47 15 2	2 25 15 7	11 18 10 4	11 52 10 9																		
W.	9	9 1	8 37 9 8	9 12 9 11	3 0 16 1	3 34 16 9	— — — —	0 25 11 3																		
Th.	10	9 47	9 39 10 2	10 4 10 5	4 0 17 5	4 24 18 1	0 50 11 8	1 14 12 2																		
F.	11	10 35	10 27 10 9	10 46 11 0	4 45 18 9	5 3 19 3	1 37 12 7	1 58 13 4																		
S.	12	11 23	11 4 11 3	11 23 11 6	5 21 19 10	5 39 20 4	2 17 13 5	2 35 13 9																		
S.	13	morn.	11 41 11 8	12 0 11 9	5 58 20 9	6 18 21 1	2 53 14 2	3 11 14 5																		
M.	14	0 13	— — — —	0 18 11 10	6 37 21 5	6 56 21 8	3 29 14 9	3 47 14 11																		
Tu.	15	1 5	0 36 11 11	0 56 11 11	7 16 21 9	7 35 21 10	4 6 15 1	4 24 15 1																		
W.	16	1 59	1 16 11 11	1 34 11 10	7 54 21 9	8 13 21 7	4 43 15 0	5 3 14 10																		
Th.	17	2 56	1 55 11 9	2 16 11 7	8 33 21 3	8 55 20 10	5 25 14 6	5 47 14 8																		
F.	18	3 54	2 37 11 5	3 0 11 2	9 18 20 4	9 41 19 9	6 9 13 10	6 35 13 5																		
S.	19	4 52	3 23 11 0	3 48 10 9	10 8 19 1	10 36 18 6	7 3 13 0	7 31 12 6																		
S.	20	5 50	4 13 10 6	4 44 10 3	11 11 17 11	11 51 17 4	8 3 12 1	8 38 11 9																		
M.	21	6 46	5 16 10 1	5 53 9 11	— — — —	0 31 17 0	9 17 11 6	10 1 11 5																		
Tu.	22	7 40	6 38 9 11	7 24 10 0	1 11 16 10	1 50 16 11	10 42 11 5	11 22 11 0																		
W.	23	8 32	8 6 10 2	8 43 10 5	2 28 17 4	3 4 18 0	11 56 12 0	— — — —																		
Th.	24	9 22	9 16 10 8	9 46 10 11	3 38 18 7	4 6 19 2	0 28 12 6	0 56 12 10																		
F.	25	10 11	10 13 11 2	10 36 11 4	4 31 19 8	4 53 20 2	1 23 13 3	1 48 13 7																		
S.	26	10 59	10 58 11 6	11 19 11 8	5 14 20 6	5 35 20 10	2 10 13 11	2 31 14 2																		
S.	27	11 47	11 40 11 9	12 0 11 10	5 56 21 0	6 17 21 2	2 51 14 4	3 9 14 6																		
M.	28	0 35	— — — —	0 18 11 9	6 36 21 2	6 56 21 2	3 28 14 7	3 47 14 7																		
Tu.	29	1 23	0 37 11 9	0 56 11 8	7 15 21 1	7 33 20 10	4 5 14 7	4 22 14 5																		
W.	30	2 11	1 14 11 6	1 31 11 4	7 49 20 8	8 6 20 4	4 39 14 3	4 56 13 10																		
Th	31	2 55	1 48 11 2	2 6 11 0	8 24 20 0	8 41 19 6	5 14 13 7	5 32 13 3																		
Half Mean Spring } Range.			5ft. 9in.				10ft. 5in.								7ft. 2in.											

Phases of the Moon.				Moon's Declination at Noon.															
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
First Quarter	5	6	17	1	13	8.14	9	11	8.5	17	17	N.31	25	0	S.50				
Full - - -	13	1	24	2	15	42	10	7	38	18	18	30	26	5	1				
Last Quarter	20	9	17	3	17	25	11	3	45	19	18	18	27	8	53				
New - - -	27	1	3	4	18	20	12	0	N.25	20	16	57	28	12	16				
				5	18	25	13	4	40	21	14	34	29	15	1				
In Apogee -	5	5	0	6	17	42	14	8	46	22	11	23	30	17	3				
In Perigee -	18	3	0	7	16	12	15	12	27	23	7	35	31	18	16				
				8	13	59	16	15	26	24	3	26							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

OCTOBER, 1867.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
Tu.	1	5 9	13 2	5 27	12 11	4 3	16 3	4 22	15 11	10 12	12 11	10 30	12 6	3.5
W.	2	5 45	12 7	6 4	12 3	4 40	15 7	4 58	15 3	10 49	12 1	11 9	11 7	4.5
Th.	3	6 22	11 10	6 41	11 5	5 17	14 9	5 37	14 3	11 29	11 1	11 50	10 7	5.5
F.	4	7 2	11 0	7 26	10 6	5 59	13 9	6 21	13 3	—	—	0 13	10 1	6.5
S.	5	7 52	10 0	8 19	9 7	6 46	12 10	7 14	12 4	0 38	9 8	1 5	9 3	7
Sa.	6	8 52	9 4	9 32	9 2	7 46	12 0	8 24	11 9	1 37	8 11	2 16	8 8	8.5
Su.	7	10 11	9 1	10 51	9 2	9 5	11 8	9 46	11 9	2 59	8 7	3 44	8 7	9.5
1.	8	11 31	9 5	—	—	10 24	11 11	10 59	12 3	4 24	8 9	5 0	8 11	10.5
2.	9	0 6	9 9	0 39	10 1	11 32	12 8	11 57	13 1	5 33	9 4	5 58	9 10	11.5
3.	10	1 2	10 6	1 24	10 11	—	—	0 18	13 8	6 19	10 5	6 38	11 0	12.5
4.	11	1 44	11 4	2 2	11 10	0 38	14 3	0 57	14 9	6 54	11 7	7 9	12 2	13.5
5.	12	2 20	12 3	2 36	12 8	1 15	15 3	1 33	15 9	7 24	12 8	7 40	13 2	14.5
6.	13	2 53	13 1	3 12	13 4	1 51	16 2	2 10	16 6	7 57	13 6	8 15	13 9	15.5
7.	14	3 29	13 7	3 47	13 9	2 27	16 9	2 44	16 11	8 32	13 11	8 50	14 0	16.5
8.	15	4 7	13 11	4 26	13 10	3 2	17 0	3 21	16 11	9 10	13 11	9 30	13 10	17.5
9.	16	4 46	13 8	5 7	13 6	3 40	16 10	4 1	16 8	9 51	13 7	10 13	13 4	18.5
10.	17	5 29	13 3	5 50	13 0	4 23	16 4	4 44	16 1	10 35	13 0	10 59	12 7	19.5
11.	18	6 13	12 9	6 37	12 4	5 7	15 9	5 33	15 4	11 25	12 1	11 53	11 7	20.5
12.	19	7 5	11 11	7 35	11 5	6 1	14 9	6 30	14 3	—	—	0 22	11 1	21.5
13.	20	8 9	10 11	8 47	10 7	7 3	13 9	7 41	13 4	0 55	10 8	1 32	10 4	22.5
14.	21	9 29	10 4	10 13	10 3	8 21	13 1	9 7	13 0	2 13	10 0	3 1	9 11	23.5
15.	22	10 54	10 5	11 35	10 8	9 49	13 1	10 28	13 4	3 47	9 11	4 29	10 1	24.5
16.	23	—	—	0 10	11 0	11 3	13 8	11 35	14 0	5 5	10 4	5 36	10 9	25.5
17.	24	0 40	11 4	1 7	11 8	—	—	0 1	14 6	6 3	11 3	6 25	11 9	26.5
18.	25	1 30	12 1	1 52	12 5	0 24	14 11	0 47	15 5	6 44	12 3	7 3	12 8	27.5
19.	26	2 13	12 9	2 32	13 1	1 9	15 10	1 29	16 2	7 20	13 1	7 38	13 5	28.5
20.	27	2 51	13 3	3 10	13 5	1 49	16 5	2 9	16 7	7 57	13 7	8 15	13 7	29.5
21.	28	3 29	13 6	3 47	13 5	2 27	16 8	2 44	16 7	8 33	13 6	8 51	13 5	30.5
22.	29	4 6	13 4	4 24	13 2	3 2	16 5	3 19	16 3	9 9	13 2	9 26	13 0	31.5
23.	30	4 42	12 11	5 0	12 8	3 36	16 0	3 54	15 8	9 44	12 8	10 3	12 4	32.5
24.	31	5 18	12 5	5 36	12 1	4 13	15 4	4 31	15 0	10 21	11 11	10 39	11 7	33.5
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	10	14	Add.	9	12	37	Add.	17	14	32	Add.
2	10	33		10	12	53		18	14	44	
3	10	52		11	13	9		19	14	55	
4	11	10		12	13	24		20	15	5	
5	11	28		13	13	38		21	15	15	
6	11	46		14	13	53		22	15	25	
7	12	3		15	14	6		23	15	33	
8	12	20		16	14	19		24	15	41	

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 8 m. | LEITH add 13 m. | THURSO add 14 m.

OCTOBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.								
Tu.	1	28 43	1 37 9 10	1 55 9 9	0 48 26 4	1 5 25 10	7 55 20 10	8 13 20 3																		
W.	2	3 31	2 12 9 7	2 29 9 6	1 22 25 1	1 39 24 5	8 31 19 9	8 48 19 1																		
Th.	3	4 19	2 46 9 3	3 4 9 1	1 56 23 8	2 14 22 11	9 6 18 5	9 23 17 8																		
F.	4	5 6	3 22 8 11	3 42 8 9	2 32 22 2	2 53 21 4	9 41 17 0	10 11 16 4																		
S.	5	5 54	4 4 8 6	4 27 8 4	3 15 20 7	3 40 19 10	10 21 15 7	10 44 14 12																		
S.	6	6 41	4 54 8 2	5 28 8 0	4 10 19 2	4 48 18 9	11 14 14 6	11 49 14 3																		
M.	7	7 28	6 6 7 10	6 46 7 9	5 29 18 7	6 15 18 9	—	0 27 14 2																		
Tu.	8	8 15	7 27 7 10	8 5 8 0	6 57 19 1	7 34 19 8	1 12 14 5	1 54 14 11																		
W.	9	9 1	8 41 8 3	9 9 8 5	8 9 20 5	8 34 21 2	2 33 15 6	3 3 16 3																		
Th.	10	9 47	9 34 8 8	9 57 8 11	8 57 22 1	9 18 22 11	3 30 17 2	3 55 17 11																		
F.	11	10 35	10 17 9 1	10 36 9 3	9 37 23 8	9 54 24 5	4 17 18 8	4 39 19 5																		
S.	12	11 23	10 56 9 5	11 16 9 7	10 11 25 0	10 30 25 8	5 0 20 1	5 21 20 1																		
S.	13	morn.	11 37 9 9	11 57 9 10	10 49 26 2	11 8 26 7	5 41 21 2	6 0 21 6																		
M.	14	0 13	—	0 16 10 0	11 27 26 11	11 47 27 2	6 19 21 10	6 38 22 8																		
Tu.	15	1 5	0 36 10 1	0 56 10 1	—	0 6 27 3	6 57 22 1	7 15 22 6																		
W.	16	1 59	1 15 10 1	1 35 9 11	0 26 27 2	0 46 26 11	7 35 21 9	7 56 21 1																		
Th.	17	2 56	1 56 10 0	2 16 9 11	1 6 26 6	1 26 26 0	8 17 21 1	8 39 20 4																		
F.	18	3 54	2 38 9 9	3 1 9 6	1 48 25 4	2 11 24 7	9 2 19 10	9 26 19 3																		
S.	19	4 52	3 25 9 4	3 51 9 2	2 35 23 9	3 2 23 0	9 50 18 6	10 16 17 9																		
S.	20	5 50	4 20 9 0	4 51 8 9	3 31 22 2	4 6 21 5	10 43 17 0	11 13 16 3																		
M.	21	6 46	5 26 8 7	6 8 8 5	4 45 20 11	5 31 20 9	11 51 16 2	—																		
Tu.	22	7 40	6 50 8 4	7 32 8 6	6 19 20 11	7 22 1 4	0 32 16 2	1 19 16 2																		
W.	23	8 32	8 11 8 8	8 45 8 10	7 39 22 0	8 12 22 8	2 2 16 11	2 39 17 2																		
Th.	24	9 22	9 16 9 10	9 43 9 2	8 40 23 5	9 4 24 1	3 11 18 4	3 41 19 4																		
F.	25	10 11	10 7 9 4	10 30 9 6	9 27 24 9	9 47 25 3	4 7 19 8	4 33 20 3																		
S.	26	10 59	10 53 9 7	11 15 9 8	10 8 25 9	10 28 26 0	4 57 20 8	5 19 21 6																		
S.	27	11 47	11 36 9 9	11 56 9 10	10 48 26 3	11 8 26 4	5 40 21 2	6 0 21 6																		
M.	28	0 35	—	0 15 9 10	11 27 26 4	11 46 26 2	6 19 21 4	6 38 21 8																		
Tu.	29	1 23	0 35 9 10	0 54 9 9	—	0 4 26 0	6 55 21 0	7 12 20 6																		
W.	30	2 11	1 11 9 8	1 29 9 7	0 22 25 9	0 39 25 4	7 29 20 4	7 46 20 3																		
Th.	31	2 59	1 46 9 6	2 2 9 5	0 56 24 10	1 13 24 3	8 4 19 6	8 21 19 3																		
Half Mean Spring Range			4ft. 10in.				13ft. 0in.				10ft. 6in.															

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
First Quarter -	5	6	17	Afternoon.
Full - - - - -	13	1	24	Afternoon.
Last Quarter -	20	9	17	Morning.
New - - - - -	27	1	3	Afternoon.
In Apogee - -	5	5	0	Afternoon.
In Perigee - -	18	3	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	13	S. 14	9	11	S. 5	17	17	N. 31	25	0	S. 5
2	15	42	10	7	38	18	18	30	26	5	
3	17	25	11	3	45	19	18	18	27	8	5
4	18	20	12	0	N. 25	20	16	57	28	12	11
5	18	25	13	4	40	21	14	34	29	15	
6	17	42	14	8	46	22	11	23	30	17	
7	16	12	15	12	27	23	7	35	31	18	11
8	13	59	16	15	26	24	3	26			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

OCTOBER, 1867.

Week Day.	Month Day.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Azn at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	
Tr.	1	8 37 37	3	8 53 36	5	11 53 15	10	—	—	0 37 10	11	0 56 10	9	3.5
V.	2	9 9 35	8	9 24 34	7	0 11 15	5	0 31 15	1	1 14 10	6	1 33 10	3	4.5
Th.	3	9 40 33	5	9 54 32	3	0 51 14	7	1 11 14	1	1 51 10	0	2 11 9	9	5.5
W.	4	10 10 31	1	10 28 29	11	1 32 13	8	1 54 13	2	2 32 9	6	2 53 9	3	6.5
S.	5	10 48 28	9	11 14 27	9	2 18 12	9	2 45 12	4	3 17 9	0	3 44 8	9	7
S.	6	11 48 27	0	—	—	3 18 12	0	3 57 11	9	4 16 8	6	4 52 8	5	8.5
Th.	7	0 25 26	7	1 6 26	6	4 38 11	8	5 19 11	10	5 29 8	4	6 8 8	5	9.5
Fr.	8	1 48 26	11	2 27 27	7	5 58 12	0	6 33 12	4	6 45 8	7	7 20 8	9	10.5
S.	9	3 5 28	6	3 37 29	7	7 6 12	9	7 30 13	2	7 54 9	0	8 21 9	3	11.5
Th.	10	4 7 30	10	4 34 32	2	7 53 13	8	8 14 14	2	8 46 9	7	9 10 9	10	12.5
W.	11	4 58 33	5	5 20 34	7	8 32 14	7	8 49 15	1	9 31 10	1	9 49 10	4	13.5
F.	12	5 41 35	8	6 2 36	7	9 6 15	6	9 24 15	10	10 5 10	7	10 21 10	10	14.5
S.	13	6 23 37	4	6 43 37	11	9 42 16	2	10 0 16	5	10 39 11	0	10 57 11	2	15.5
Th.	14	7 2 38	6	7 21 39	0	10 17 16	7	10 34 16	9	11 15 11	4	11 35 11	4	16.5
Fr.	15	7 40 39	0	7 59 39	0	10 52 16	9	11 11 16	8	11 54 11	4	—	—	17.5
S.	16	8 18 38	9	8 38 38	3	11 32 16	6	11 54 16	3	0 14 11	5	0 35 11	2	18.5
Th.	17	8 57 37	9	9 17 36	11	—	—	0 17 16	0	0 57 11	0	1 19 10	9	19.5
W.	18	9 37 35	10	9 57 34	8	0 41 15	7	1 7 15	1	1 42 10	6	2 7 10	3	20.5
F.	19	10 18 33	5	10 43 32	2	1 35 14	8	2 4 14	2	2 34 10	0	3 2 9	10	21.5
S.	20	11 12 31	1	11 46 30	2	2 36 13	9	3 13 13	4	3 34 9	7	4 11 9	4	22.5
Th.	21	—	—	0 27 29	8	3 55 13	1	4 40 13	0	4 50 9	1	5 31 9	0	23.5
Fr.	22	1 10 29	8	1 54 30	1	5 22 13	2	6 2 13	5	6 10 9	2	6 49 9	4	24.5
S.	23	2 34 30	10	3 13 31	10	6 37 13	9	7 8 14	1	7 24 9	7	7 58 9	9	25.5
Th.	24	3 48 32	10	4 19 33	11	7 36 14	6	8 0 14	11	8 38 10	0	8 56 10	3	26.5
W.	25	4 48 35	0	5 14 35	10	8 22 15	3	8 42 15	7	9 21 10	5	9 42 10	8	27.5
F.	26	5 38 36	7	6 0 37	2	9 2 15	11	9 22 16	1	10 1 10	10	10 20 11	0	28.5
S.	27	6 22 37	5	6 42 37	7	9 42 16	2	10 0 16	3	10 38 11	1	10 57 11	1	29.5
Th.	28	7 2 37	8	7 21 37	7	10 17 16	3	10 34 16	2	11 15 11	1	11 34 11	0	30.5
Fr.	29	7 38 37	4	7 55 36	11	10 50 16	0	11 6 15	9	11 52 10	11	—	—	31.5
S.	30	8 12 36	5	8 28 35	10	11 25 15	6	11 44 15	3	0 10 10	9	0 28 10	7	3.0
Th.	31	8 44 35	2	8 59 34	6	—	—	0 2 14	11	0 47 10	5	1 5 10	3	4.0
Half Moon Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Half Moon Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	10 14		9	12 37		17	14 32		25	15 48	
2	10 33		10	12 53		18	14 44		26	15 54	
3	10 52		11	13 9		19	14 55		27	16 0	
4	11 10		12	13 24		20	15 5		28	16 5	
5	11 28		13	13 38		21	15 15		29	16 9	
6	11 46		14	13 53		22	15 25		30	16 13	
7	12 3		15	14 6		23	15 33		31	16 15	
8	12 20		16	14 19		24	15 41				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Wexford add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

OCTOBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.							
		H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.					
Tu.	1	28 43	0 13	9 6	0 32	9 5	9 38	7 5	9 55	7 2	7 0	10 10	7 18	10 6												
W.	2	3 31	0 50	9 3	1 10	9 1	10 12	7 0	10 29	6 8	7 36	10 2	7 53	9 9												
Th.	3	4 19	1 30	8 11	1 52	8 9	10 50	6 5	11 15	6 1	8 12	9 4	8 33	9 0												
F.	4	5 6	2 14	8 7	2 37	8 5	11 43	5 9	—	—	8 57	8 8	9 25	8 4												
S.	5	5 54	3 1	8 3	3 27	8 1	0 15	5 6	0 48	5 3	9 53	8 1	10 27	7 10												
S.	6	6 41	3 57	7 11	4 33	7 10	1 26	5 2	2 8	5 2	11 5	7 9	11 44	7 8												
M.	7	7 28	5 11	7 9	5 49	7 9	2 48	5 3	3 27	5 5	—	—	0 23	7 9												
Tu.	8	8 15	6 29	7 9	7 5	7 10	4 2	5 7	4 32	5 10	1 3	7 10	1 38	8 1												
W.	9	9 1	7 39	8 0	8 6	8 2	5 0	6 1	5 20	6 3	2 13	8 5	2 37	8 9												
Th.	10	9 47	8 27	8 5	8 48	8 8	5 39	6 6	5 58	6 9	2 58	9 2	3 18	9 7												
F.	11	10 35	9 7	8 11	9 24	9 1	6 17	7 0	6 35	7 3	3 34	10 0	3 51	10 4												
S.	12	11 23	9 42	9 3	10 0	9 5	6 54	7 5	7 13	7 8	4 8	10 9	4 26	11 1												
S.	13	morn.	10 19	9 6	10 36	9 7	7 32	7 10	7 50	7 11	4 45	11 4	5 5	11 6												
M.	14	0 13	10 54	9 8	11 12	9 8	8 7	8 0	8 25	8 1	5 24	11 8	5 42	11 9												
Tu.	15	1 5	11 30	9 8	11 49	9 8	8 42	8 1	9 0	8 0	6 0	11 9	6 19	11 7												
W.	16	1 59	—	—	0 11	9 7	9 19	7 10	9 38	7 8	6 40	11 5	7 1	11 2												
Th.	17	2 56	0 33	9 6	0 56	9 5	9 58	7 6	10 21	7 3	7 22	10 10	7 44	10 6												
F.	18	3 54	1 20	9 4	1 47	9 2	10 46	7 0	11 17	6 8	8 8	10 1	8 36	9 9												
S.	19	4 52	2 16	9 0	2 46	8 9	11 53	6 4	—	—	9 7	9 5	9 42	9 1												
S.	20	5 50	3 18	8 7	3 53	8 5	0 34	6 0	1 18	5 11	10 22	8 10	11 3	8 2												
M.	21	6 46	4 31	8 4	5 12	8 3	2 6	5 10	2 50	5 11	11 46	8 8	—	—												
Tu.	22	7 40	5 53	8 2	6 34	8 3	3 29	6 2	4 5	6 5	0 27	8 8	1 7	8 10												
W.	23	8 32	7 11	8 4	7 43	8 6	4 34	6 7	4 59	6 10	1 43	9 1	2 15	9 3												
Th.	24	9 22	8 10	8 9	8 34	9 0	5 22	7 0	5 44	7 2	2 41	9 9	3 4	10 2												
F.	25	10 11	8 57	9 2	9 18	9 4	6 7	7 4	6 29	7 6	3 24	10 6	3 44	10 9												
S.	26	10 59	9 38	9 5	9 58	9 6	6 51	7 8	7 12	7 9	4 4	11 0	4 25	11 3												
S.	27	11 47	10 17	9 7	10 36	9 7	7 32	7 10	7 50	7 10	4 45	11 4	5 5	11 5												
M.	28	0 35	10 54	9 6	11 12	9 6	8 7	7 10	8 24	7 9	5 24	11 5	5 42	11 4												
Tu.	29	1 23	11 28	9 5	11 45	9 4	8 40	7 8	8 56	7 6	5 50	11 2	6 15	11 6												
W.	30	2 11	—	—	0 4	9 3	9 13	7 4	9 29	7 1	6 34	10 9	6 52	10 6												
Th.	31	2 59	0 22	9 2	0 41	9 1	9 45	6 11	10 2	6 9	7 9	10 1	7 26	9 9												
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.															
Phases of the Moon.							Moon's Declination at Noon.																			
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'								
First Quarter	5	6	17	Afternoon.			1	13	S. 14	9	11	S. 5	17	17	N. 31	25	0	S. 50								
Full - - - - -	13	1	24	Afternoon.			2	15	42	10	7	38	18	18	30	26	5	1								
Last Quarter -	20	9	17	Morning.			3	17	25	11	3	45	19	18	18	27	8	53								
New - - - - -	27	1	3	Afternoon.			4	18	20	12	0	N. 25	20	16	57	28	12	16								
							5	18	25	13	4	40	21	14	34	29	15	1								
In Apogee - -	5	5	0	Afternoon.			6	17	42	14	8	46	22	11	23	30	17	3								
In Perigee - -	18	3	0	Morning.			7	16	12	15	12	27	23	7	35	31	18	16								
							8	13	59	16	15	26	24	3	26											

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

BRITISH AND IRISH PORTS.

OCTOBER, 1867.

WIND DIRECTION.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				Tide Gauge.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
	1	6 21	14 8	6 39	14 3	6 47	11 8	7 4	11 5	7 8	12 6	7 25	12 3	■
	2	6 58	13 9	7 16	13 4	7 22	11 1	7 39	10 9	7 42	12 0	7 58	11 9	4
	3	7 36	12 9	7 57	12 2	7 56	10 5	8 13	10 1	8 15	11 5	8 31	11 1	5
	4	8 18	11 7	8 42	11 0	8 31	9 8	8 52	9 4	8 48	10 9	9 7	10 5	6
	5	9 7	10 6	9 36	10 3	9 13	9 0	9 39	8 9	9 29	10 1	9 59	9 8	
	6	10 13	9 11	10 53	9 10	10 12	8 7	10 51	8 5	10 34	9 5	11 11	9 3	■
	7	11 35	9 11	—	—	11 32	8 5	—	—	11 49	9 2	—	—	9
	8	0 15	10 2	0 50	10 6	0 13	8 7	0 52	8 10	0 26	9 4	1 2	9 6	10
	9	1 23	11 0	1 48	11 6	1 30	9 1	1 59	9 5	1 38	9 10	2 8	10 2	11
	10	2 10	12 0	2 32	12 7	2 25	9 9	2 49	10 2	2 37	10 7	3 4	11 0	12
	11	2 53	13 1	3 11	13 7	3 11	10 7	3 31	10 11	3 27	11 4	3 49	11 8	13
	12	3 28	14 0	3 46	14 5	3 50	11 3	4 9	11 6	4 11	12 0	4 32	12 3	14
	13	4 5	14 10	4 23	15 2	4 29	11 10	4 49	12 0	4 52	12 6	5 11	12 8	(
	14	4 41	15 5	5 1	15 7	5 9	12 2	5 29	12 3	5 29	12 10	5 49	12 11	16
	15	5 21	15 8	5 40	15 7	5 48	12 4	6 7	12 3	6 8	13 0	6 28	13 0	17
	16	6 1	15 5	6 22	15 1	6 27	12 2	6 48	12 0	6 49	13 0	7 9	12 10	18
	17	6 44	14 10	7 7	14 4	7 9	11 9	7 31	11 6	7 29	12 8	7 50	12 5	19
	18	7 32	13 11	7 59	13 4	7 53	11 2	8 16	10 10	8 11	12 2	8 33	11 10	20
	19	8 27	12 8	8 58	12 1	8 40	10 5	9 8	10 1	8 56	11 5	9 22	11 12	21
	20	9 32	11 8	10 11	11 4	9 37	9 9	10 11	9 6	9 55	10 9	10 33	10 5	22
	21	10 55	11 3	11 38	11 5	10 53	9 5	11 36	9 5	11 13	10 3	11 52	10 22	23
	22	—	—	0 19	11 8	—	—	0 18	9 7	—	—	0 30	10 42	24
	23	0 55	12 0	1 26	12 6	0 58	9 10	1 35	10 1	1 7	10 6	1 44	10 10	25
	24	1 53	12 11	2 18	13 4	2 7	10 5	2 35	10 9	2 18	11 2	2 49	11 6	26
	25	2 43	13 9	3 6	14 2	3 1	11 0	3 24	11 4	3 17	11 10	3 43	12 12	27
	26	3 25	14 6	3 45	14 9	3 47	11 7	4 8	11 9	4 7	12 3	4 30	12 5	28
	27	4 5	14 11	4 23	15 0	4 28	11 10	4 48	11 11	4 51	12 6	5 11	12 6	29
	28	4 41	15 0	5 0	15 0	5 8	11 11	5 28	11 10	5 29	12 6	5 48	12 6	30
	29	5 19	14 10	5 37	14 7	5 46	11 9	6 3	11 8	6 6	12 5	6 24	12 4	31
	30	5 55	14 4	6 12	14 0	6 21	11 6	6 38	11 3	6 42	12 2	6 59	12 0	32
	31	6 30	13 8	6 48	13 3	6 55	11 0	7 12	10 9	7 16	11 10	7 32	11 8	33
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
10 14		9	12 37		17	14 32		25	15 48	
10 33		10	12 53		18	14 44		26	15 54	
10 52		11	13 9		19	14 55		27	16 0	
11 10		12	13 24		20	15 5		28	16 5	
11 28		13	13 38		21	15 15		29	16 9	
11 46		14	13 53		22	15 25		30	16 13	
12 3		15	14 6		23	15 33		31	16 15	
12 20		16	14 19		24	15 41				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —
 GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.	M.	Tu.	W.	Th.	F.	S.

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.			
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.
1	1	34	17	4		3	6	15	2	3	23	14	11
2	2	11	16	5		3	40	14	7	3	58	14	2
3	3	49	15	6		4	18	13	10	4	39	13	6
4	4	34	14	7		5	3	13	2	5	30	12	11
5	5	29	13	10		6	1	12	8	6	38	12	6
6	6	36	13	9		7	17	12	6	7	58	12	6
7	7	47	14	5		8	37	12	11	9	12	13	3
8	8	51	15	6		9	44	13	8	10	12	14	0
9	9	40	16	8		10	36	14	6	10	58	14	10
10	10	26	17	10		11	19	15	3	11	39	15	8
11	11	9	18	9		11	59	16	0	1	10	18	3
12	12	53	19	4		0	19	16	3	0	39	16	6
13	13	39	19	8		0	59	16	8	1	19	16	9
14	14	3	19	8		1	40	16	9	2	1	16	9
15	15	52	10	4		2	23	16	8	2	45	16	6
						3	8	16	2	3	32	15	11
						3	57	15	6	4	23	15	1
						4	51	14	8	5	22	14	4
						5	56	14	0	6	34	13	8
						7	13	13	7	7	55	13	8
						8	34	13	10	9	9	14	1
						9	43	14	4	10	12	14	7
						10	38	14	10	11	2	15	1
						11	24	15	3	11	46	15	6
						0	25	15	8	0	6	15	7
						1	2	15	9	1	20	15	9
						1	38	15	8	1	55	15	7
						2	13	15	5	2	30	15	4
						2	45	15	2	3	1	14	11
										4	15	18	3

8ⁿ. 0ⁱⁿ.9ⁿ. 7ⁱⁿ.

Equation of Time at Noon.

N.	Add.	M.D.	M. S.	Add.	M.D.	M. S.
4		17	14 57		25	12 56
58		18	14 44		26	12 37
52		19	14 31		27	12 17
45		20	14 17		28	11 57
37		21	14 3		29	11 36
28		22	13 47		30	11 15
19		23	13 31			
8		24	13 14			

Mean Time at Place; if Greenwich or Railway Time be require

1

SHEERNESS subtract 3 m.

1

LONDON 0 m.

P 2

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
F.	1	5 54	11 10	6 11	11 6	4 49	14 9	5 7	14 4	10 58	11 2	11 18	10 9	5.0												
S.	2	6 31	11 1	6 51	10 9	5 27	13 11	5 48	13 6	11 39	10 4	—	—	6.0												
S.	3	7 14	10 5	7 40	10 0	6 10	13 1	6 35	12 9	0 2	9 11	0 27	9 7	7.0												
M.	4	8 9	9 8	8 42	9 5	7 4	12 4	7 36	12 1	0 54	9 3	1 27	9 1	8.0												
Tu.	5	9 21	9 4	10 0	9 4	8 13	11 11	8 53	11 11	2 5	8 11	2 46	8 10	9.0												
W.	6	10 37	9 6	11 15	9 9	9 32	12 0	10 8	12 3	3 29	9 0	4 8	9 1	10.0												
Th.	7	11 49	10 0	—	—	10 42	12 7	11 11	13 0	4 43	9 3	5 13	9 7	11.0												
F.	8	0 18	10 5	0 43	10 9	11 38	13 5	12 0	13 11	5 39	10 1	6 2	10 8	12.0												
S.	9	1 6	11 2	1 26	11 7	—	—	0 21	14 5	6 21	11 3	6 39	11 10	13.0												
S.	10	1 47	12 1	2 7	12 6	0 41	15 0	1 2	15 6	6 57	12 5	7 13	12 11	14.0												
M.	11	2 25	12 11	2 44	13 3	1 22	16 0	1 41	16 5	7 31	13 4	7 49	13 9	15.0												
Tu.	12	3 2	13 6	3 22	13 9	2 1	16 9	2 21	17 0	8 8	14 0	8 28	14 1	16.0												
W.	13	3 43	13 11	4 4	14 0	2 40	17 1	2 59	17 1	8 48	14 1	9 11	14 0	17.0												
Th.	14	4 26	13 11	4 49	13 8	3 21	16 11	3 44	16 10	9 34	13 10	9 58	13 7	18.0												
F.	15	5 13	13 6	5 38	13 2	4 8	16 7	4 32	16 3	10 23	13 2	10 48	12 10	19.0												
S.	16	6 3	12 11	6 29	12 7	4 57	16 0	5 24	15 7	11 16	12 4	11 44	11 11	20.0												
S.	17	6 55	12 2	7 26	11 9	5 52	15 1	6 22	14 7	—	—	0 14	11 5	21.0												
M.	18	8 0	11 3	8 36	10 10	6 54	14 1	7 31	13 8	0 46	11 0	1 21	10 7	22.0												
Tu.	19	9 15	10 7	9 57	10 6	8 9	13 4	8 49	13 3	2 0	10 4	2 41	10 2	23.0												
W.	20	10 35	10 7	11 12	10 9	9 30	13 3	10 6	13 4	3 26	10 1	4 5	10 2	24.0												
Th.	21	11 46	10 11	—	—	10 39	13 6	11 10	13 10	4 40	10 3	5 12	10 5	25.0												
F.	22	0 17	11 2	0 43	11 4	11 38	14 1	—	—	5 39	10 9	6 4	11 1	26.0												
S.	23	1 8	11 7	1 30	11 10	0 2	14 4	0 24	14 8	6 25	11 6	6 44	11 11	27.0												
S.	24	1 52	12 1	2 13	12 4	0 46	14 11	1 8	15 4	7 3	12 2	7 20	12 6	28.0												
M.	25	2 32	12 6	2 50	12 8	1 28	15 7	1 47	15 9	7 37	12 8	7 55	12 10	29.0												
Tu.	26	3 8	12 9	3 26	12 9	2 6	15 10	2 24	15 11	8 12	12 10	8 29	12 10	30.0												
W.	27	3 44	12 9	4 2	12 9	2 41	15 11	2 58	15 9	8 46	12 9	9 4	12 7	1.3												
Th.	28	4 20	12 7	4 39	12 5	3 15	15 7	3 33	15 4	9 23	12 4	9 41	12 2	2.3												
F.	29	4 56	12 3	5 13	12 0	3 51	15 2	4 8	14 11	9 58	11 11	10 16	11 8	3.3												
S.	30	5 31	11 9	5 50	11 6	4 26	14 9	4 44	14 6	10 35	11 4	10 55	11 0	4.3												
Half Mean Spring } Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	17		9	16	4		17	14	57		25	12	56	
2	16	18		10	15	58		18	14	44		26	12	37	
3	16	19		11	15	52		19	14	31		27	12	17	
4	16	18		12	15	45		20	14	17		28	11	57	
5	16	17		13	15	37		21	14	3		29	11	36	
6	16	15		14	15	28		22	13	47		30	11	15	
7	16	12		15	15	19		23	13	31					
8	16	8		16	15	8		24	13	14					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 0 m. LEITH add 13 m. THURSO add 14 m.

TIDE TABLES FOR THE

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.						LIVERPOOL.						PEMBROKE.							
			MORNING.				AFTERNOON.		MORNING.				AFTERNOON.		MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H. M.	H. M.	F. I.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
F.	1	38 47	2 19	9 3	2 36	9 1	1 29	23 8	1 46	23 0	8 38	18 6	8 55	17 11								
S.	2	4 34	2 53	8 11	3 11	8 10	2 4	22 4	2 22	21 9	9 12	17 4	9 30	16 9								
S.	3	5 21	3 31	8 8	3 53	8 6	2 42	21 1	3 4	20 6	9 50	16 3	10 12	15 8								
M.	4	6 7	4 17	8 4	4 46	8 2	3 30	19 10	4 1	19 4	10 36	15 2	11 5	14 9								
Tu.	5	6 53	5 19	8 1	5 55	8 0	4 37	19 1	5 17	19 0	11 38	14 7	—	—								
W.	6	7 38	6 32	7 11	7 11	8 0	5 59	19 2	6 41	19 7	0 13	14 8	0 54	14 11								
Th.	7	8 24	7 46	8 2	8 19	8 4	7 16	20 2	7 47	20 10	1 34	15 4	2 10	15 11								
F.	8	9 12	8 48	8 7	9 14	8 10	8 15	21 8	8 39	22 6	2 42	16 8	3 9	17 6								
S.	9	10 1	9 38	9 0	10 1	9 2	9 0	23 4	9 21	24 2	3 35	18 4	4 0	19 1								
S.	10	10 52	10 23	9 4	10 44	9 6	9 41	24 11	10 0	25 6	4 24	19 9	4 47	20 5								
M.	11	11 46	11 6	9 8	11 27	9 10	10 20	26 0	10 40	26 6	5 10	20 11	5 32	21 5								
Tu.	12	morn.	11 49	9 11	—	—	11 1	26 11	11 22	27 2	5 53	21 9	6 14	22 1								
W.	13	0 43	0 11	10 0	0 33	10 1	11 44	27 4	—	—	6 35	22 2	6 57	22 2								
Th.	14	1 43	0 56	10 1	1 18	10 1	0 6	27 4	0 29	27 2	7 19	22 0	7 42	21 9								
F.	15	2 43	1 41	10 0	2 5	9 11	0 52	26 10	1 15	26 3	8 6	21 4	8 30	20 10								
S.	16	3 43	2 29	9 10	2 53	9 8	1 38	25 9	2 2	25 0	8 54	20 3	9 18	19 7								
S.	17	4 42	3 17	9 6	3 43	9 3	2 27	24 3	2 54	23 6	9 43	18 11	10 9	18 3								
M.	18	5 37	4 12	9 1	4 43	8 11	3 23	22 8	3 56	22 0	10 37	17 6	11 5	16 11								
Tu.	19	6 30	5 16	8 9	5 52	8 7	4 33	21 7	5 13	21 2	11 37	16 7	—	—								
W.	20	7 20	6 30	8 6	7 8	8 6	5 55	21 2	6 38	21 5	0 12	16 6	0 51	16 6								
Th.	21	8 8	7 44	8 7	8 18	8 9	7 13	21 9	7 47	22 3	1 31	16 9	2 10	17 2								
F.	22	8 56	8 48	8 10	9 17	9 0	8 15	22 9	8 41	23 3	2 42	17 8	3 12	18 2								
S.	23	9 43	9 43	9 0	10 7	9 2	9 4	23 9	9 26	24 2	3 41	18 8	4 7	19 1								
S.	24	10 29	10 30	9 3	10 52	9 4	9 47	24 6	10 7	24 9	4 32	19 6	4 55	19 10								
M.	25	11 17	11 13	9 4	11 33	9 5	10 27	24 11	10 46	25 0	5 17	20 0	5 38	20 1								
Tu.	26	0 4	11 53	9 5	—	—	11 5	25 1	11 23	25 2	5 57	20 2	6 15	20 3								
W.	27	0 53	0 12	9 6	0 30	9 6	11 42	25 1	12 0	25 0	6 33	20 2	6 51	20 1								
Th.	28	1 41	0 49	9 5	1 8	9 5	—	—	0 19	24 9	7 9	19 11	7 26	19 8								
F.	29	2 29	1 25	9 4	1 41	9 4	0 36	24 6	0 52	24 3	7 42	19 4	7 59	19 0								
S.	30	3 16	1 58	9 3	2 16	9 2	1 8	23 10	1 25	23 4	8 17	18 8	8 36	18 4								
Half Mean Spring } Range.			4ft. 10in.						13ft. 0in.						10ft. 6in.							
Phases of the Moon.										Moon's Declination at Noon.												
D. H. M.										M.D. ° ' "												
First Quarter - 4 2 27 Afternoon.										1 18 8.39 9 2N.53 17 15N.26 25 14S.17												
Full - - - - - 12 1 9 Morning.										2 18 13 10 7 7 18 12 22 26 16 35												
Last Quarter - 18 5 6 Afternoon.										3 16 59 11 11 6 19 8 40 27 18 6												
New - - - - - 26 5 11 Morning.										4 15 1 12 14 31 20 4 36 28 18 47												
										5 12 23 13 17 3 21 0 22 29 18 39												
In Apogee - - 2 2 0 Afternoon.										6 9 9 14 18 29 22 3S.49 30 17 41												
In Perigee - - 14 9 0 Morning.										7 5 27 15 18 40 23 7 46												
In Apogee - - 30 8 0 Morning.										8 1 23 16 17 36 24 11 18												

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.					HOLYHEAD.					KINGSTOWN.					Age AT NOON.
		MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
		Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.			
		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		D.	
	1	9 14 33 7		9 30 32 11		0 21 14 8		0 40 14 2		1 23 10 0		1 40 9 9				5.0	
	2	9 44 31 9		9 59 30 9		1 0 13 9		1 21 13 5		2 1 9 7		2 21 9 4				6.0	
	3	10 18 29 9		10 39 28 10		1 43 13 0		2 8 12 8		2 42 9 2		3 6 9 0				7.0	
	4	11 6 28 1		11 39 27 6		2 35 12 4		3 8 12 1		3 34 8 9		4 6 8 7				8.0	
	5	— — — —		0 14 27 2		3 46 11 11		4 26 11 11		4 43 8 6		5 19 8 5				9.0	
	6	0 52 27 4		1 32 27 9		5 5 12 1		5 42 12 4		5 54 8 7		6 29 8 9				10.0	
	7	2 8 28 4		2 42 29 3		6 16 12 8		6 45 13 0		7 2 8 11		7 32 9 2				11.0	
	8	3 17 30 4		3 46 31 6		7 11 13 6		7 35 13 11		8 1 9 5		8 26 9 9				12.0	
	9	4 13 32 9		4 40 34 0		7 56 14 5		8 17 14 11		8 50 10 0		9 14 10 3				13.0	
	10	5 5 35 3		5 28 36 3		8 36 15 4		8 55 15 9		9 36 10 6		9 54 10 9				14.0	
	11	5 51 37 1		6 13 37 9		9 15 16 1		9 34 16 4		10 12 10 11		10 30 11 2				15.0	
	12	6 35 38 5		6 57 38 11		9 54 16 7		10 13 16 9		10 50 11 4		11 11 11 5				16.0	
	13	7 19 39 3		7 40 39 2		10 32 16 10		10 52 16 9		11 32 11 5		11 55 11 4				17.0	
	14	8 2 39 0		8 24 38 8		11 14 16 8		11 38 16 5		— — — —		0 18 11 3				18.0	
	15	8 47 38 1		9 9 37 5		— — — —		0 4 16 2		0 42 11 1		1 7 10 11				19.0	
	16	9 31 36 5		9 52 35 4		0 31 15 10		0 58 15 4		1 32 10 8		1 58 10 5				20.0	
	17	10 13 34 3		10 36 33 0		1 25 14 11		1 55 14 6		2 25 10 2		2 54 10 0				21.0	
	18	11 4 31 10		11 36 30 11		2 27 14 0		3 2 13 8		3 25 9 9		4 1 9 6				22.0	
	19	— — — —		0 12 30 5		3 41 13 4		4 22 13 3		4 39 9 3		5 16 9 2				23.0	
	20	0 49 30 2		1 29 30 4		5 3 13 3		5 40 13 5		5 52 9 3		6 27 9 4				24.0	
	21	2 6 30 8		2 42 31 3		6 13 13 7		6 44 13 10		7 0 9 6		7 31 9 8				25.0	
	22	3 16 31 10		3 50 32 7		7 11 14 1		7 37 14 5		8 1 9 10		8 29 9 11				26.0	
	23	4 19 33 4		4 47 34 1		8 0 14 8		8 22 14 11		8 56 10 1		9 20 10 3				27.0	
	24	5 13 34 9		5 36 35 3		8 42 15 1		9 2 15 4		9 42 10 5		10 0 10 6				28.0	
	25	5 58 35 6		6 19 35 9		9 21 15 5		9 40 15 6		10 18 10 7		10 36 10 8				29.0	
	26	6 39 35 10		6 58 35 11		9 57 15 6		10 14 15 6		10 54 10 8		11 12 10 9				30.0	
	27	7 17 35 11		7 35 35 9		10 30 15 5		10 47 15 4		11 30 10 8		11 48 10 7				1.3	
	28	7 53 35 6		8 9 35 2		11 4 15 2		11 21 15 0		— — — —		0 7 10 6				2.3	
	29	8 24 34 10		8 40 34 5		11 39 14 10		11 57 14 7		0 25 10 4		0 42 10 3				3.3	
	30	8 56 33 11		9 13 33 3		— — — —		0 16 14 4		1 0 10 1		1 19 9 11				4.3	

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
1	16 17		9	16 4		17	14 57		25	12 56	
2	16 18		10	15 58		18	14 44		26	12 37	
3	16 19		11	15 52		19	14 31		27	12 17	
4	16 18		12	15 45		20	14 17		28	11 57	
5	16 17		13	15 37		21	14 3		29	11 36	
6	16 15		14	15 28		22	13 47		30	11 15	
7	16 12		15	15 19		23	13 31				
8	16 8		16	15 8		24	13 14				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required. — for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	3a 47	1 0	8 11	1 19	8 10	10 20	6 6	10 39	6 3	7 43	9 6	8 29	8 29
S.	2	4 34	1 41	8 8	2 3	8 6	11 4	6 0	11 31	5 9	8 23	8 10	8 46	8 46
♄.	3	5 21	2 25	8 4	2 50	8 2	—	—	0 2	5 5	9 13	8 3	9 43	8 43
M.	4	6 7	3 17	8 1	3 48	8 0	0 37	5 4	1 15	5 3	10 17	7 11	10 55	7 11
Tu.	5	6 53	4 24	7 11	5 0	7 10	1 58	5 3	2 37	5 4	11 33	7 11	—	—
W.	6	7 38	5 36	7 10	6 13	7 11	3 13	5 6	3 47	5 9	0 10	8 0	0 47	8 0
Th.	7	8 24	6 48	8 0	7 19	8 1	4 16	6 0	4 41	6 3	1 21	8 4	1 51	8 4
F.	8	9 12	7 46	8 3	8 9	8 6	5 2	6 5	5 21	6 8	2 18	9 0	2 40	9 0
S.	9	10 1	8 30	8 9	8 51	9 0	5 40	6 11	6 1	7 2	3 0	9 9	3 19	10 9
♄.	10	10 52	9 11	9 2	9 31	9 4	6 22	7 5	6 43	7 7	3 38	10 7	3 57	10 11
M.	11	11 46	9 50	9 6	10 9	9 7	7 3	7 9	7 24	7 11	4 17	11 3	4 37	11 6
Tu.	12	morn.	10 30	9 8	10 50	9 9	7 44	8 0	8 3	8 2	4 58	11 8	5 19	11 13
W.	13	0 43	11 10	9 9	11 30	9 8	8 22	8 2	8 42	8 1	5 39	11 10	6 0	11 9
Th.	14	1 43	11 53	9 8	—	—	9 3	8 0	9 25	7 10	6 23	11 7	6 47	11 4
F.	15	2 43	0 18	9 7	0 43	9 6	9 48	7 7	10 11	7 5	7 11	11 0	7 35	10 8
S.	16	3 43	1 9	9 5	1 37	9 3	10 36	7 2	11 6	6 10	7 59	10 4	8 26	9 11
♄.	17	4 42	2 6	9 1	2 37	8 10	11 42	6 6	—	—	8 57	9 7	9 33	9 3
M.	18	5 37	3 9	8 8	3 43	8 6	0 22	6 2	1 5	6 0	10 11	9 0	10 50	8 11
Tu.	19	6 30	4 20	8 5	4 57	8 4	1 51	5 11	2 34	6 0	11 30	8 10	—	—
W.	20	7 20	5 34	8 3	6 10	8 3	3 12	6 2	3 44	6 4	0 7	8 10	0 44	8 11
Th.	21	8 8	6 45	8 4	7 18	8 5	4 13	6 6	4 39	6 8	1 18	9 0	1 50	9 1
F.	22	8 56	7 46	8 6	8 11	8 8	5 1	6 10	5 23	6 11	2 18	9 6	2 42	9 5
S.	23	9 43	8 34	8 10	8 56	9 0	5 44	7 0	6 6	7 2	3 4	10 0	3 24	10 1
♄.	24	10 29	9 18	9 2	9 38	9 3	6 28	7 3	6 50	7 4	3 44	10 5	4 4	10 1
M.	25	11 17	9 57	9 3	10 15	9 3	7 10	7 4	7 30	7 5	4 23	10 9	4 43	10 11
Tu.	26	0a 4	10 33	9 3	10 51	9 3	7 47	7 5	8 4	7 6	5 2	10 10	5 20	10 1
W.	27	0 53	11 8	9 3	11 25	9 2	8 21	7 5	8 37	7 4	5 38	10 10	5 55	10 1
Th.	28	1 41	11 42	9 2	12 0	9 1	8 54	7 2	9 10	7 1	6 12	10 7	6 30	10 1
F.	29	2 29	—	—	0 18	9 0	9 25	6 11	9 40	6 9	6 47	10 2	7 4	9 1
S.	30	3 16	0 36	8 11	0 55	8 10	9 58	6 7	10 17	6 5	7 22	9 8	7 41	9 1
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			

Phases of the Moon.

	D.	H.	M.	
First Quarter	4	2	27	Afternoon.
Full - - - -	12	1	9	Morning.
Last Quarter	18	5	6	Afternoon.
New - - - -	26	5	11	Morning.
In Apogee - -	2	2	0	Afternoon.
In Perigee - -	14	9	0	Morning.
In Apogee - -	30	8	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	S. 39	9	2	N. 53	17	15	N. 26	25	14	S. 1
2	18	13	10	7	7	18	12	22	26	16	3
3	16	59	11	11	6	19	8	40	27	18	
4	15	1	12	14	31	20	4	36	28	18	
5	12	23	13	17	3	21	0	22	29	18	
6	9	9	14	18	29	22	3	S. 49	30	17	
7	5	27	15	18	40	23	7	46			
8	1	23	16	17	36	24	11	18			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, -
BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m

NOVEMBER, 1867.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	D.
		7 5 12 10	7 25 12 5	7 29 10 6	7 46 10 2	7 48 11 5	8 4 11 2	5.0						
		7 46 12 0	8 7 11 5	8 3 9 11	8 21 9 7	8 20 10 11	8 37 10 8	6.0						
		8 31 11 0	8 56 10 7	8 42 9 4	9 4 9 1	8 56 10 4	9 20 10 1	7.0						
		9 27 10 4	10 3 10 1	9 30 8 10	10 3 8 9	9 50 9 10	10 25 9 7	D						
		0 41 10 1	11 21 10 3	10 40 8 8	11 18 8 8	11 0 9 6	11 35 9 5	9.0						
		1 59 10 6	—	11 57 8 10	—	—	0 10 9 7	10.0						
		0 33 10 10	1 3 11 3	0 32 9 0	1 6 9 4	0 44 9 9	1 16 10 0	11.0						
		1 29 11 9	1 52 12 4	1 38 9 8	2 5 10 0	1 47 10 5	2 16 10 9	12.0						
		2 14 12 10	2 36 13 5	2 30 10 4	2 54 10 9	2 43 11 2	3 9 11 6	13.0						
		2 57 13 10	3 17 14 3	3 17 11 1	3 39 11 5	3 35 11 10	3 58 12 2	14.0						
		3 37 14 8	3 57 15 0	4 0 11 9	4 20 11 11	4 21 12 5	4 43 12 8	15.0						
		4 17 15 5	4 37 15 7	4 41 12 2	5 3 12 4	5 4 12 9	5 25 12 11	0						
		4 59 15 9	5 21 15 8	5 26 12 4	5 48 12 4	5 46 13 0	6 8 13 0	17.0						
		5 44 15 7	6 8 15 4	6 11 12 3	6 34 12 2	6 31 13 0	6 55 12 11	18.0						
		6 32 15 0	6 57 14 8	6 58 11 11	7 22 11 8	7 19 12 9	7 42 12 7	19.0						
		7 23 14 2	7 50 13 8	7 46 11 4	8 9 11 0	8 5 12 4	8 27 12 0	20.0						
		8 19 13 1	8 50 12 6	8 34 10 8	9 1 10 4	8 50 11 8	9 15 11 4	21.0						
		9 23 12 0	9 59 11 8	9 29 10 0	10 0 9 9	9 46 11 0	10 22 10 8	22.0						
		10 38 11 7	11 18 11 7	10 37 9 8	11 15 9 7	10 58 10 6	11 34 10 4	23.0						
		11 56 11 8	—	11 54 9 7	—	—	0 8 10 4	24.0						
		0 30 11 11	1 2 12 3	0 30 9 9	1 6 9 11	0 42 10 6	1 15 10 8	25.0						
		1 29 12 6	1 54 12 10	1 38 10 1	2 8 10 4	1 48 10 10	2 20 11 12	26.0						
		2 18 13 1	2 42 13 5	2 35 10 6	3 0 10 9	2 49 11 4	3 16 11 6	27.0						
		3 4 13 7	3 24 13 10	3 24 10 11	3 45 11 1	3 42 11 9	4 5 11 10	28.0						
		3 44 13 11	4 3 14 1	4 6 11 3	4 26 11 4	4 28 11 11	4 49 12 0	29.0						
		4 20 14 2	4 38 14 3	4 45 11 4	5 4 11 5	5 8 12 0	5 25 12 0	30.0						
		4 56 14 3	5 15 14 2	5 23 11 4	5 42 11 3	5 43 12 0	6 2 12 0	1.3						
		5 34 14 0	5 51 13 10	6 1 11 2	6 17 11 1	6 20 11 11	6 38 11 10	2.3						
		6 8 13 7	6 26 13 4	6 34 11 0	6 50 10 10	6 55 11 9	7 12 11 7	3.3						
		6 44 13 0	7 4 12 9	7 8 10 7	7 27 10 4	7 29 11 6	7 46 11 4	4.3						
Half Mean Spring }		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
16 4		17	14 57		25	12 56	
15 58		18	14 44		26	12 37	
15 52		19	14 31		27	12 17	
15 45		20	14 17		28	11 57	
15 37		21	14 3		29	11 36	
15 28		22	13 47		30	11 15	
15 19		23	13 31				
15 8		24	13 14				

for Mean Time at Place; if Dublin or Railway Time be required,—for
 | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

DECEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																																																																																																																																																																																																																																																																									
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																																					
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																																																																																																																																																																																																																																																																								
		H. M.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.																																																																																																																																																																																																																																																																									
S.	1	4 22	6 27 16 0	6 45 15 6	8 9 13 8	8 26 12 10	2 9 11 4	2 28 11 2	M.	2	4 47	7 6 15 1	7 29 14 8	8 43 13 1	9 3 12 3	2 46 11 0	3 6 10 10	Tu.	3	5 32	7 52 14 2	8 17 13 10	9 25 12 7	9 46 11 9	3 28 10 8	3 50 10 3	W.	4	6 17	8 44 13 7	9 17 13 6	10 13 12 2	10 44 11 6	4 14 10 3	4 40 10 1	Th.	5	7 2	9 51 13 7	10 30 13 9	11 17 12 1	11 54 11 9	5 11 10 0	5 44 9 11	F.	6	7 49	11 6 14 1	11 40 14 6	—	—	0 33 12 6	6 19 10 0	6 54 10 2	S.	7	8 38	—	—	0 11 15 1	1 10 12 5	1 46 13 3	7 27 10 6	8 0 10 10	S.	8	9 29	0 41 15 9	1 8 16 5	2 20 13 4	2 49 14 0	8 31 11 2	8 59 11 7	M.	9	10 25	1 31 17 1	1 54 17 10	3 18 14 3	3 45 14 8	9 25 11 11	9 49 12 2	Tu.	10	11 24	2 17 18 6	2 40 19 2	4 10 15 0	4 35 15 4	10 12 12 6	10 36 13 6	W.	11	morn.	3 4 19 9	3 28 20 0	5 1 15 7	5 24 15 10	11 0 12 11	11 24 13 1	Th.	12	0 25	3 53 20 3	4 17 20 4	5 48 16 1	6 14 16 0	11 49 13 3	—	—	F.	13	1 28	4 41 20 4	5 5 20 2	6 38 16 5	7 1 16 0	0 15 13 3	0 40 13 1	S.	14	2 30	5 29 19 10	5 54 19 6	7 23 16 3	7 47 15 8	1 5 13 2	1 30 13 1	S.	15	3 29	6 20 19 0	6 46 18 5	8 12 15 11	8 36 15 0	1 55 12 11	2 21 13 1	M.	16	4 25	7 12 17 8	7 38 17 0	9 0 15 3	9 24 14 3	2 47 12 5	3 13 12 1	Tu.	17	5 17	8 5 16 3	8 33 15 8	9 49 14 5	10 15 13 4	3 38 11 10	4 4 11 1	W.	18	6 7	9 2 15 2	9 35 14 11	10 43 13 8	11 12 12 9	4 30 11 2	4 58 10 1	Th.	19	6 55	10 11 14 9	10 48 14 7	11 45 13 1	—	—	5 28 10 8	6 0 10 1	F.	20	7 41	11 26 14 8	—	—	0 21 13 8	0 57 13 1	6 37 10 5	7 14 10 1	S.	21	8 28	0 4 14 10	0 35 15 0	1 34 12 11	2 7 13 3	7 48 10 7	8 21 10 1	S.	22	9 14	1 2 15 4	1 27 15 8	2 37 13 4	3 8 13 7	8 53 11 0	9 19 11 1	M.	23	10 1	1 51 16 1	2 14 16 6	3 33 13 10	3 58 14 0	9 45 11 4	10 9 11 1	Tu.	24	10 49	2 34 16 10	2 54 17 2	4 23 14 2	4 44 14 3	10 29 11 7	10 50 11 1	W.	25	11 37	3 14 17 5	3 33 17 7	5 5 14 7	5 25 14 6	11 10 11 10	11 29 11 1	Th.	26	0 24	3 51 17 8	4 9 17 8	5 43 14 10	6 1 14 6	11 47 11 11	—	—	F.	27	1 12	4 25 17 8	4 42 17 8	6 19 14 11	6 35 14 5	0 5 11 11	0 22 11 1	S.	28	1 58	4 59 17 7	5 16 17 5	6 51 14 11	7 5 14 3	0 40 11 10	0 58 11 1	S.	29	2 44	5 32 17 3	5 48 17 2	7 21 14 8	7 37 13 11	1 16 11 9	1 33 11 1	M.	30	3 29	6 5 16 11	6 24 16 8	7 53 14 3	8 10 13 5	1 49 11 8	2 6 11 1	Tu.	31	4 13	6 42 16 4	7 1 16 0	8 26 13 9	8 42 13 0	2 25 11 6	2 43 11 1
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																																																																																																																																																																																																																																																																									

Phases of the Moon.					Moon's Declination at Noon.											
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter-	4	10	21	Morning.	1	15	S. 57	9	13	N. 0	17	5	N. 52	25	18	S. 4
Full - - - - -	11	0	10	Afternoon.	2	13	33	10	16	2	18	1	35	26	18	S. 5
Last Quarter -	18	3	34	Morning.	3	10	34	11	18	5	19	2	S. 40	27	18	S. 6
New - - - - -	25	11	39	Afternoon.	4	7	4	12	18	52	20	6	42	28	16	S. 7
<hr/>					5	3	12	13	18	19	21	10	21	29	14	S. 8
In Perigee - -	12	2	0	Afternoon.	6	0	N. 56	14	16	29	22	13	29	30	11	S. 9
In Apogee - -	27	8	0	Afternoon.	7	5	9	15	13	36	23	15	59	31	8	S. 10
					8	9	16	16	9	57	24	17	45			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

DECEMBER, 1867.

DOVER.								SHEERNESS.								LONDON.							
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
H. M. P. L.	H. M. P. L.			H. M. P. L.	H. M. P. L.			H. M. P. L.	H. M. P. L.			H. M. P. L.	H. M. P. L.			H. M. P. L.	H. M. P. L.			H. M. P. L.	H. M. P. L.		
1 49 16 9	2 9 16 6			3 19 14 9	3 38 14 6			4 50 17 10	5 8 17 7			5 28 16 2	2 47 15 10			3 57 14 3	4 16 13 11			5 27 17 4	5 47 17 1		
3 9 15 6	3 31 15 2			4 36 13 9	5 0 13 6			6 7 16 10	6 29 16 7			3 54 14 10	4 19 14 7			5 51 13 3	6 54 16 4			7 20 16 2	7 20 16 2		
4 47 14 4	5 16 14 3			6 22 12 11	6 57 12 11			7 49 15 11	8 24 15 10			4 47 14 4	5 16 14 3			6 57 12 11	7 49 15 11			8 24 15 10	8 24 15 10		
5 48 14 4	6 20 14 8			7 33 13 0	8 11 13 1			9 0 15 10	9 36 15 10			5 48 14 4	6 20 14 8			7 33 13 0	8 11 13 1			9 36 15 10	9 36 15 10		
6 53 15 2	7 26 15 8			8 45 13 5	9 18 13 9			10 10 16 1	10 42 16 4			6 53 15 2	7 26 15 8			8 45 13 5	9 18 13 9			10 10 16 1	10 42 16 4		
7 56 16 3	8 23 16 9			9 48 14 2	10 17 14 6			11 13 16 7	11 43 17 0			7 56 16 3	8 23 16 9			9 48 14 2	10 17 14 6			11 13 16 7	11 43 17 0		
8 48 17 3	9 12 17 10			10 42 14 11	11 5 15 3			—	0 10 17 5			8 48 17 3	9 12 17 10			10 42 14 11	11 5 15 3			—	0 10 17 5		
9 37 18 3	10 3 18 9			11 27 15 7	11 50 15 11			0 34 17 10	0 57 18 8			9 37 18 3	10 3 18 9			11 27 15 7	11 50 15 11			0 34 17 10	0 57 18 8		
10 28 19 1	10 54 19 4			—	0 13 16 9			1 22 18 8	1 44 19 0			10 28 19 1	10 54 19 4			—	0 13 16 9			1 22 18 8	1 44 19 0		
11 21 19 7	11 48 19 8			0 37 16 6	1 1 16 8			2 8 19 4	2 32 19 7			11 21 19 7	11 48 19 8			0 37 16 6	1 1 16 8			2 8 19 4	2 32 19 7		
—	0 14 19 9			1 25 16 10	2 49 16 10			3 54 19 10	3 18 20 0			—	0 14 19 9			1 25 16 10	2 49 16 10			3 54 19 10	3 18 20 0		
0 40 19 8	1 7 19 5			2 12 16 9	3 35 16 8			4 42 20 0	4 7 19 11			0 40 19 8	1 7 19 5			2 12 16 9	3 35 16 8			4 42 20 0	4 7 19 11		
1 34 19 3	2 1 18 10			2 59 16 6	3 24 16 3			4 81 19 9	4 55 19 6			1 34 19 3	2 1 18 10			2 59 16 6	3 24 16 3			4 81 19 9	4 55 19 6		
2 28 18 5	2 54 17 11			3 50 15 11	4 16 15 7			5 22 19 2	5 48 18 10			2 28 18 5	2 54 17 11			3 50 15 11	4 16 15 7			5 22 19 2	5 48 18 10		
3 19 17 5	3 45 16 10			4 42 15 2	5 9 14 10			6 13 18 5	6 40 18 0			3 19 17 5	3 45 16 10			4 42 15 2	5 9 14 10			6 13 18 5	6 40 18 0		
4 11 16 4	4 37 15 10			5 37 14 5	6 8 14 2			7 7 17 7	7 37 17 3			4 11 16 4	4 37 15 10			5 37 14 5	6 8 14 2			7 7 17 7	7 37 17 3		
5 4 15 6	5 34 15 2			6 40 13 10	7 15 13 8			8 8 16 11	8 43 16 8			5 4 15 6	5 34 15 2			6 40 13 10	7 15 13 8			8 8 16 11	8 43 16 8		
6 6 15 1	6 40 15 2			7 53 13 7	8 29 13 8			9 18 16 6	9 53 16 4			6 6 15 1	6 40 15 2			7 53 13 7	8 29 13 8			9 18 16 6	9 53 16 4		
7 13 15 5	7 46 15 8			9 5 13 9	9 37 13 11			10 29 16 5	11 4 16 0			7 13 15 5	7 46 15 8			9 5 13 9	9 37 13 11			10 29 16 5	11 4 16 0		
8 17 15 11	8 43 16 2			10 8 14 2	10 38 14 4			11 34 16 7	—			8 17 15 11	8 43 16 2			10 8 14 2	10 38 14 4			11 34 16 7	—		
9 8 16 5	9 32 16 8			11 2 14 6	11 25 14 8			0 4 16 9	0 31 16 11			9 8 16 5	9 32 16 8			11 2 14 6	11 25 14 8			0 4 16 9	0 31 16 11		
9 54 16 10	10 16 17 11			11 47 14 10	—			0 52 17 2	1 14 17 5			9 54 16 10	10 16 17 11			11 47 14 10	—			0 52 17 2	1 14 17 5		
10 37 17 3	10 57 17 4			0 7 15 0	0 27 15 2			1 38 17 7	1 57 17 9			10 37 17 3	10 57 17 4			0 7 15 0	0 27 15 2			1 38 17 7	1 57 17 9		
11 19 17 6	11 38 17 6			0 47 15 3	1 6 15 8			2 16 17 11	2 35 18 1			11 19 17 6	11 38 17 6			0 47 15 3	1 6 15 8			2 16 17 11	2 35 18 1		
11 56 17 6	—			1 24 15 4	1 41 15 4			2 53 18 2	3 10 18 3			11 56 17 6	—			1 24 15 4	1 41 15 4			2 53 18 2	3 10 18 3		
0 14 17 6	0 33 17 6			1 57 15 4	2 13 15 3			3 28 18 3	3 44 18 3			0 14 17 6	0 33 17 6			1 57 15 4	2 13 15 3			3 28 18 3	3 44 18 3		
0 52 17 5	1 10 17 4			2 30 15 3	2 46 15 2			4 1 18 3	4 18 18 3			0 52 17 5	1 10 17 4			2 30 15 3	2 46 15 2			4 1 18 3	4 18 18 3		
1 28 17 3	1 47 17 2			3 2 15 0	3 18 14 11			4 33 18 2	4 50 18 0			1 28 17 3	1 47 17 2			3 2 15 0	3 18 14 11			4 33 18 2	4 50 18 0		
1 2 6 17 0	2 25 16 9			3 35 14 9	3 54 14 7			5 7 17 11	5 26 17 9			1 2 6 17 0	2 25 16 9			3 35 14 9	3 54 14 7			5 7 17 11	5 26 17 9		
If Mean Spring } Range.				9ft. 4in.				8ft. 0in.				9ft. 7in.											

If Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	S.
10	53		9	7	34		17	3	48		25	0	11	S
10	30		10	7	7		18	3	19	.	26	0	41	
10	6		11	6	40		19	2	49		27	1	10	
9	42		12	6	12		20	2	19		28	1	40	
9	18		13	5	44		21	1	49		29	2	10	
8	53		14	5	16		22	1	19		30	2	39	
8	27		15	4	47		23	0	49		31	3	8	
8	1		16	4	18		24	0	19					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required.

DOVER subtract 5 m.

SHEERNESS subtract 3 m.

LONDON 0 m.

DECEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	4a 2	2 37	10 6	2 56	10 4	9 14	18 4	9 33	18 0	6 5	12 5	6 26	12 2												
M.	2	4 47	3 15	10 3	3 33	10 1	9 52	17 8	10 12	17 4	6 47	11 11	7 8	11 8												
Tu.	3	5 32	3 52	9 11	4 14	9 10	10 37	17 0	11 4	16 8	7 32	11 6	7 57	11 3												
W.	4	6 17	4 37	9 9	5 3	9 8	11 35	16 5	—	—	8 23	11 1	8 53	10 1												
Th.	5	7 2	5 30	9 7	6 3	9 7	0 7	16 2	0 41	16 1	9 28	10 10	10 3	10 10												
F.	6	7 49	6 40	9 8	7 19	9 9	1 14	16 1	1 46	16 4	10 38	11 0	11 10	11 5												
S.	7	8 38	7 53	9 11	8 25	10 2	2 17	16 9	2 47	17 3	11 40	11 7	—	—												
S.	8	9 29	8 55	10 5	9 24	10 8	3 16	17 11	3 45	18 7	0 8	12 0	0 35	12 3												
M.	9	10 25	9 51	10 11	10 16	11 2	4 11	19 2	4 34	19 8	1 1	12 11	1 26	13 3												
Tu.	10	11 24	10 39	11 5	11 2	11 7	4 56	20 3	5 18	20 8	1 50	13 8	2 14	14 3												
W.	11	morn.	11 26	11 10	11 50	11 11	5 42	21 1	6 7	21 5	2 38	14 4	3 1	14 3												
Th.	12	0 25	—	—	0 14	12 0	6 32	21 8	6 57	21 11	3 24	14 10	3 48	15 3												
F.	13	1 28	0 38	12 1	1 3	12 0	7 22	22 0	7 46	22 0	4 12	15 3	4 35	15 3												
S.	14	2 30	1 27	11 11	1 51	11 10	8 10	21 10	8 34	21 7	4 59	15 1	5 24	14 3												
S.	15	3 29	2 16	11 8	2 42	11 6	8 59	21 2	9 25	20 8	5 50	14 5	6 17	14 3												
M.	16	4 25	3 8	11 4	3 33	11 2	9 52	20 2	10 18	19 7	6 45	13 8	7 13	13 3												
Tu.	17	5 17	3 59	10 11	4 25	10 8	10 45	19 0	11 17	18 6	7 41	12 11	8 10	12 3												
W.	18	6 7	4 51	10 6	5 19	10 4	11 51	18 0	—	—	8 40	12 3	9 11	11 3												
Th.	19	6 55	5 48	10 2	6 21	10 1	0 25	17 7	0 58	17 3	9 46	11 9	10 22	11 3												
F.	20	7 41	7 0	10 1	7 37	10 1	1 31	17 1	2 4	17 1	10 56	11 6	11 29	11 3												
S.	21	8 28	8 12	10 2	8 44	10 3	2 35	17 3	3 6	17 7	11 59	11 9	—	—												
S.	22	9 14	9 15	10 4	9 45	10 6	3 37	17 11	4 7	18 3	0 28	12 0	0 56	13 3												
M.	23	10 1	10 11	10 8	10 36	10 9	4 31	18 6	4 54	18 9	1 21	12 5	1 46	13 3												
Tu.	24	10 49	10 58	10 10	11 19	11 0	5 15	19 0	5 35	19 2	2 10	12 10	2 31	13 3												
W.	25	11 37	11 40	11 1	12 0	11 1	5 56	19 4	6 16	19 5	2 52	13 1	3 11	13 3												
Th.	26	0a 24	—	—	0 19	11 1	6 36	19 6	6 54	19 7	3 28	13 4	3 46	13 3												
F.	27	1 12	0 36	11 1	0 53	11 1	7 12	19 8	7 29	19 7	4 5	13 6	4 20	13 3												
S.	28	1 58	1 10	11 0	1 27	11 0	7 47	19 7	8 3	19 7	4 36	13 6	4 53	13 3												
S.	29	2 44	1 44	10 11	2 2	10 10	8 20	19 6	8 37	19 4	5 10	13 4	5 27	13 3												
M.	30	3 29	2 19	10 9	2 36	10 8	8 53	19 2	9 12	18 11	5 44	13 0	6 2	12 3												
Tu.	31	4 13	2 54	10 7	3 12	10 5	9 30	18 7	9 48	18 4	6 22	12 7	6 42	12 3												

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

<i>Phases of the Moon.</i>				<i>Moon's Declination at Noon.</i>												
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter -	4	10	21	Morning.	1	15	S. 57	9	13	N. 0	17	5	N. 52	25	18	S. 4
Full - - -	11	0	10	Afternoon.	2	13	33	10	16	2	18	1	35	26	18	5
Last Quarter -	18	3	34	Morning.	3	10	34	11	18	5	19	2	S. 40	27	18	5
New - - -	25	11	39	Afternoon.	4	7	4	12	18	52	20	6	42	28	16	4
					5	3	12	13	18	19	21	10	21	29	14	3
In Perigee -	12	2	0	Afternoon.	6	0	N. 56	14	16	29	22	13	29	30	11	4
In Apogee -	27	8	0	Afternoon.	7	5	9	15	13	36	23	15	59	31	8	2
					8	9	16	16	9	57	24	17	45			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

DECEMBER, 1867.

WIND DAY.	MOON DAY.	NORTH SHIELDS.		LEITH.		THURSO.		C's AGE AT NOON.
		MORNING.	AFTERNOON.	MORNING.	AFTERNOON.	MORNING.	AFTERNOON.	
		Height. I.	Time. H. M. P.	Height. I.	Time. H. M. P.	Height. I.	Time. H. M. P.	D.
4	3	5 24	14	0 11	16 10	9 11	37 10	6 5.3
3	8	6 7	13	4 11	58 10	2	—	6.3
3	1	6 56	12	10 0	22 9	11 0	48 9	9 7.3
2	7	7 57	12	5 1	16 9	7 1	48 9	5 7.3
2	5	9 8	12	5 2	25 9	4 3	2 9	4 9.3
2	7	10 16	12	10 3	43 9	5 4	16 9	7 10.3
3	2	11 16	13	7 4	48 9	10 5	17 10	3 11.3
4	0	—	—	5 44	10 8	6 8	11 3	12.3
4	6	0 27	14	11 6	28 11	9 6	47 12	4 13.3
5	6	1 12	15	11 7	6 12	10 7	26 13	4 14.3
6	5	1 59	16	9 7	47 13	9 8	10 14	0 15.3
7	0	2 46	17	2 8	34 14	1 8	58 14	2 16.3
7	2	3 33	17	1 9	22 14	1 9	47 13	10 17.3
6	10	4 22	16	7 10	12 13	7 10	39 13	3 18.3
6	4	5 15	16	0 11	7 12	10 11	36 12	5 19.3
5	7	6 12	15	2	—	—	0 4 12	0 20.3
4	8	7 9	14	3 0	32 11	6 1	1 11	2 21.3
3	11	8 15	13	6 1	32 10	10 2	6 10	6 22.3
3	4	9 28	13	3 2	43 10	3 3	23 10	1 23.3
3	2	10 35	13	3 4	1 10	0 4	36 10	0 24.3
3	4	11 34	13	6 5	7 10	1 5	36 10	2 25.3
—	—	0 2	13	9 6	4 10	5 6	25 10	9 26.3
4	0	0 47	14	3 6	46 11	1 7	6 11	4 27.3
14	6	1 29	14	9 7	23 11	8 7	40 11	11 28.3
15	0	2 9	15	2 7	58 12	2 8	16 12	3 29.3
15	3	2 45	15	4 8	33 12	4 8	49 12	4 30.3
15	5	3 17	15	4 9	5 12	3 9	22 12	2 31.3
15	3	3 50	15	1 9	40 12	1 9	58 12	0 32.3
15	0	4 25	14	10 10	15 11	10 10	33 11	8 33.3
4	9	5 1	14	7 10	51 11	5 11	11 11	2 34.3
14	5	5 40	14	3 11	32 11	0 11	53 10	10 35.3

8ft. 2in.

6ft. 7in.

n of Time at Noon.

Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.
	17	3 48		25	0 11	
	18	3 19		26	0 41	
	19	2 49		27	1 10	
	20	2 19		28	1 40	
	21	1 49		29	2 10	
	22	1 19		30	2 39	
	23	0 49		31	3 8	
	24	0 19				

Time at Place; if Greenwich or Railway Time be required,—for
 LEITH add 13 m. | THURSO add 14 m.

DECEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	42 2	2 34	9 0	2 52	8 11	1 44	22 10	2 3	22 5	8 55	17 11	9 12	17 1
Tu.	2	4 47	3 10	8 10	3 29	8 9	2 21	21 11	2 40	21 6	9 29	17 1	9 49	16 1
W.	3	5 32	3 51	8 8	4 14	8 6	3 22	21 1	3 24	20 7	10 10	16 4	10 32	16 1
Th.	4	6 17	4 38	8 5	5 5	8 4	3 50	20 3	4 21	19 11	10 55	15 7	11 23	15 1
F.	5	7 2	5 37	8 3	6 10	8 2	4 56	19 9	5 33	19 10	11 53	15 4	—	—
S.	6	7 49	6 45	8 2	7 19	8 3	6 14	20 1	6 49	20 7	0 26	15 6	1 3	15 1
S.	7	8 38	7 52	8 5	8 23	8 7	7 21	21 2	7 52	21 11	1 41	16 3	2 15	16 1
S.	8	9 29	8 53	8 9	9 21	9 0	8 20	22 8	8 45	23 5	2 47	17 7	3 16	18 1
M.	9	10 25	9 46	9 3	10 10	9 5	9 7	24 2	9 29	24 11	3 44	19 0	4 10	19 1
Tu.	10	11 24	10 33	9 6	10 59	9 8	9 51	25 6	10 14	26 1	4 36	20 4	5 3	21 1
W.	11	morn.	11 25	9 10	11 51	9 11	10 38	26 6	11 3	26 11	5 30	21 5	5 55	21 1
Th.	12	0 25	—	—	0 17	10 0	11 28	27 3	11 53	27 5	6 19	22 1	6 44	23 1
F.	13	1 28	0 42	10 1	1 7	10 2	—	—	0 17	27 5	7 8	22 3	7 32	23 1
S.	14	2 30	1 31	10 1	1 55	10 1	0 42	27 3	1 6	26 11	7 56	21 9	8 22	21 1
S.	15	3 29	2 20	10 0	2 46	9 10	1 31	26 5	1 56	25 9	8 48	20 11	9 13	20 1
M.	16	4 25	3 11	9 8	3 36	9 6	2 21	25 1	2 46	24 5	9 37	19 8	10 1	19 1
Tu.	17	5 17	4 1	9 4	4 27	9 2	3 12	23 9	3 38	22 11	10 25	18 6	10 49	17 1
W.	18	6 7	4 54	9 0	5 23	8 10	4 8	22 4	4 40	21 8	11 13	17 2	11 39	16 1
Th.	19	6 55	5 54	8 8	6 28	8 6	5 15	21 4	5 52	21 1	—	—	0 11	16 1
F.	20	7 41	7 3	8 5	7 39	8 6	6 32	21 1	7 9	21 3	0 45	16 4	1 25	15 1
S.	21	8 28	8 12	8 7	8 44	8 8	7 40	21 6	8 12	21 10	2 2	16 6	2 36	16 1
S.	22	9 14	9 15	8 9	9 41	8 10	8 41	22 2	9 4	22 7	3 9	17 3	3 36	17 1
M.	23	10 1	10 6	8 11	10 29	8 11	9 27	23 0	9 49	23 4	4 3	18 0	4 29	18 1
Tu.	24	10 49	10 51	9 0	11 13	9 1	10 8	23 7	10 28	23 10	4 54	18 8	5 17	18 1
W.	25	11 37	11 35	9 1	11 55	9 2	10 48	24 0	11 7	24 1	5 39	19 2	5 59	19 1
Th.	26	0 24	—	—	0 14	9 3	11 26	24 3	11 44	24 5	6 18	19 6	6 35	19 1
F.	27	1 12	0 32	9 3	0 49	9 3	—	—	0 1	24 4	6 52	19 7	7 8	19 1
S.	28	1 58	1 7	9 3	1 25	9 3	0 18	24 4	0 36	24 4	7 25	19 6	7 42	19 1
S.	29	2 44	1 43	9 3	1 58	9 3	0 53	24 3	1 9	24 0	7 59	19 2	8 16	19 1
M.	30	3 29	2 14	9 3	2 32	9 2	1 25	23 9	1 42	23 5	8 34	18 10	8 52	18 1
Tu.	31	4 13	2 50	9 1	3 7	9 0	2 0	23 1	2 18	22 10	9 10	18 3	9 28	18 1
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
First Quarter 4 10 21 Morning.							1	15	57	9	13	N. 0	17	5
Full - - - - 11 0 10 Afternoon.							2	13	33	10	16	2	18	1
Last Quarter - 18 3 34 Morning.							3	10	34	11	18	5	19	2
New - - - - 25 11 39 Afternoon.							4	7	4	12	18	52	20	6
							5	3	12	13	18	19	21	10
							6	0	N. 56	14	16	29	22	13
In Perigee - - 12 2 0 Afternoon.							7	5	9	15	13	36	23	15
In Apogee - - 27 8 0 Afternoon.							8	9	16	16	9	57	24	17

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

DECEMBER, 1867.

MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age at Noon.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
1	9	30	32	8	9	45	32	0	0	37	14	1	0	58	13	9	1	38	9	9	1	58	9	7	5.
2	10	03	31	4	10	17	30	8	1	18	13	6	1	40	13	3	2	18	9	5	2	39	9	3	6.
3	10	37	29	11	10	59	29	4	2	3	13	0	2	29	12	9	3	3	9	2	3	28	9	0	7.
4	11	25	18	10	11	57	28	6	2	57	12	4	3	29	12	5	3	56	8	11	4	27	8	9	8.
5	—	—	—	—	0	30	28	4	4	5	12	5	4	42	12	6	5	0	8	9	5	33	8	9	9.
6	1	5	28	7	1	40	29	2	5	18	12	8	5	50	12	11	6	7	8	11	6	37	9	1	10.
7	2	14	29	10	2	47	30	9	6	21	13	3	6	49	13	8	7	8	9	3	7	37	9	6	11.
8	3	31	31	9	3	54	32	10	7	16	14	1	7	41	14	6	8	6	9	9	8	33	10	0	12.
9	4	22	33	11	4	50	35	1	8	3	14	11	8	25	15	4	8	59	10	3	9	23	10	6	13.
10	5	18	36	1	5	45	37	1	8	47	15	9	9	9	16	1	9	46	10	9	10	8	10	11	14.
11	6	11	37	11	6	37	38	5	9	32	16	5	9	56	16	7	10	30	11	2	10	53	11	3	15.
12	7	3	39	0	7	28	39	4	10	19	16	9	10	41	16	10	11	17	11	4	11	41	11	5	16.
1	7	52	39	4	8	15	39	2	11	3	16	10	11	27	16	—	—	—	—	—	0	6	11	4	17.
2	8	38	38	9	9	2	38	4	11	53	16	6	—	—	—	0	31	11	3	0	56	11	1	18.	
3	9	26	37	7	9	49	36	7	0	20	16	3	0	49	15	10	1	23	10	11	1	50	10	8	19.
4	10	10	35	7	10	30	34	6	1	17	15	5	1	45	15	0	2	18	10	6	2	45	10	3	20.
5	10	51	33	4	11	16	32	4	2	13	14	7	2	42	14	2	3	12	10	0	3	40	9	10	21.
6	11	43	31	4	—	—	—	—	3	13	13	10	3	47	13	6	4	12	9	7	4	45	9	4	22.
7	0	14	30	8	0	48	30	3	4	24	13	4	5	1	13	3	5	18	9	3	5	51	9	2	23.
8	1	23	30	0	1	59	30	0	5	36	13	3	6	9	13	4	6	24	9	3	6	56	9	4	24.
9	2	34	30	3	3	9	30	7	6	39	13	5	7	8	13	7	7	26	9	5	7	56	9	6	25.
10	3	44	31	1	4	14	31	7	7	36	13	9	7	59	14	0	8	26	9	7	8	53	9	9	26.
11	4	44	32	3	5	10	32	10	8	22	14	2	8	44	14	5	9	19	9	10	9	42	10	0	27.
12	5	34	33	4	5	58	33	10	9	2	14	6	9	22	14	8	10	2	10	1	10	21	10	2	28.
1	6	20	34	2	6	41	34	5	9	42	14	10	10	1	14	11	10	40	10	3	10	57	10	4	29.
2	7	0	34	8	7	19	34	10	10	18	15	0	10	34	15	0	11	15	10	5	11	32	10	5	30.
3	7	36	34	11	7	52	34	11	10	48	15	0	11	4	15	0	11	49	10	5	—	—	—	—	31.
4	8	9	34	11	8	26	34	9	11	21	14	11	11	39	14	10	0	6	10	4	0	24	10	4	32.
5	8	41	34	7	8	56	34	5	11	56	14	9	—	—	—	0	42	10	3	0	59	10	2	33.	
6	9	12	34	1	9	29	33	9	0	14	14	7	0	33	14	5	1	17	10	1	1	36	10	11	34.
7	9	45	33	3	10	1	32	10	0	53	14	3	1	14	14	0	1	55	9	10	2	14	10	8	35.

DECEMBER, 1867.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.								
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.						
S.	1	4 22	1 16	8 9	1 37	8 8	10 37	6 3	10 59	6 1	8 0	9 2	8 19	8 11												
M.	2	4 47	1 59	8 7	2 22	8 5	11 24	5 10	11 55	5 8	8 41	8 9	9 9	8 6												
Tu.	3	5 32	2 46	8 4	3 11	8 3	—	—	0 27	5 6	9 36	8 4	10 6	8 3												
W.	4	6 17	3 38	8 2	4 8	8 1	1 0	5 5	1 37	5 5	10 38	8 2	11 14	8 2												
Th.	5	7 2	4 42	8 0	5 15	8 0	2 17	5 6	2 52	5 7	11 48	8 3	—	—												
F.	6	7 49	5 48	8 0	6 21	8 1	3 26	5 10	3 54	6 1	0 22	8 4	0 55	8 7												
S.	7	8 38	6 53	8 2	7 23	8 4	4 21	6 4	4 44	6 7	1 26	8 10	1 55	9 1												
S.	8	9 29	7 51	8 6	8 15	8 9	5 6	6 9	5 27	7 0	2 23	9 5	2 46	9 9												
M.	9	10 25	8 37	9 0	8 59	9 2	5 47	7 2	6 9	7 5	3 7	10 2	3 27	10 6												
Tu.	10	11 24	9 22	9 4	9 45	9 6	6 32	7 7	6 57	7 9	3 48	10 10	4 11	11 2												
W.	11	morn.	10 8	9 7	10 32	9 8	7 22	7 11	7 46	8 0	4 35	11 6	5 0	11 8												
Th.	12	0 25	10 56	9 9	11 19	9 9	8 9	8 2	8 32	8 2	5 25	11 10	5 49	11 18												
F.	13	1 28	11 42	9 9	—	—	8 54	8 1	9 16	8 0	6 12	11 10	6 36	11 8												
S.	14	2 30	0 6	9 8	0 32	9 7	9 39	7 10	10 3	7 7	7 1	11 5	7 27	11 1												
S.	15	3 29	0 59	9 6	1 28	9 5	10 29	7 5	10 56	7 2	7 53	10 9	8 19	10 4												
M.	16	4 25	1 57	9 3	2 26	9 1	11 27	6 11	—	—	8 46	10 0	9 15	9 8												
Tu.	17	5 17	2 55	8 11	3 25	8 9	0 1	6 7	0 38	6 3	9 48	9 5	10 22	9 2												
W.	18	6 7	3 55	8 7	4 26	8 6	1 16	6 2	1 57	6 0	10 56	9 0	11 32	8 18												
Th.	19	6 55	4 59	8 5	5 32	8 4	2 36	6 0	3 11	6 1	—	—	0 6	8 10												
F.	20	7 41	6 6	8 3	6 41	8 3	3 42	6 2	4 12	6 4	0 40	8 10	1 14	8 10												
S.	21	8 28	7 12	8 3	7 42	8 4	4 37	6 5	5 1	6 6	1 45	8 11	2 15	9 8												
S.	22	9 14	8 11	8 5	8 34	8 7	5 24	6 7	5 45	6 8	2 43	9 3	3 5	9 8												
M.	23	10 1	8 57	8 9	9 19	8 10	6 7	6 9	6 29	6 10	3 26	9 8	3 46	9 10												
Tu.	24	10 49	9 39	8 11	9 59	9 0	6 50	6 11	7 11	7 0	4 5	10 0	4 25	10 8												
W.	25	11 37	10 18	9 1	10 36	9 1	7 32	7 1	7 51	7 1	4 45	10 4	5 4	10 8												
Th.	26	0 24	10 54	9 1	11 11	9 1	8 8	7 2	8 24	7 3	5 23	10 6	5 41	10 8												
F.	27	1 12	11 26	9 1	11 42	9 1	8 39	7 2	8 54	7 1	5 56	10 7	6 12	10 8												
S.	28	1 58	11 59	9 0	—	—	9 10	7 0	9 26	6 11	6 29	10 5	6 47	10 8												
S.	29	2 44	0 17	9 0	0 35	9 0	9 42	6 10	9 57	6 9	7 4	10 1	7 21	9 18												
M.	30	3 29	0 53	8 11	1 12	8 11	10 14	6 8	10 33	6 6	7 38	9 9	7 56	9 8												
Tu.	31	4 13	1 32	8 10	1 53	8 9	10 52	6 5	11 15	6 3	8 15	9 4	8 35	9 8												
Half Mean Spring } Range.			4ft. 9in.								3ft. 10in.								5ft. 7in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
First Quarter 4 10 21 Morning.												1 15 S. 57 9 13 N. 0 17 5 N. 52 25 18 S. 41														
Full - - - - 11 0 10 Afternoon.												2 13 33 10 16 2 18 1 35 26 18 5														
Last Quarter - 18 3 34 Morning.												3 10 34 11 18 5 19 28. 40 27 18 8														
New - - - - 25 11 39 Afternoon.												4 7 4 12 18 52 20 6 42 28 16 4														
In Perigee - - 12 2 0 Afternoon.												5 3 12 13 18 19 21 10 21 29 14 2														
In Apogee - - 27 8 0 Afternoon.												6 0 N. 56 14 16 29 22 13 29 30 11 4														
												7 5 9 15 13 36 23 15 59 31 8 22														
												8 9 16 16 9 57 24 17 45														

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6 0	6 0
Feet.	Add							Subtract						
	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	3 0	2 11	2 7	2 1	1 6	0 9	0 0	0 9	1 6	2 1	2 7	2 11	3 0	3 0
4	4 0	3 10	3 6	2 10	2 0	1 0	0 0	1 0	2 0	2 10	3 6	3 10	4 0	4 0
5	5 0	4 10	4 4	3 6	2 6	1 3	0 0	1 3	2 6	3 6	4 4	4 10	5 0	5 0
6	6 0	5 10	5 2	4 3	3 0	1 7	0 0	1 7	3 0	4 3	5 2	5 10	6 0	6 0
7	7 0	6 9	6 1	4 11	3 6	1 10	0 0	1 10	3 6	4 11	6 1	6 9	7 0	7 0
8	8 0	7 9	6 11	5 8	4 0	2 1	0 0	2 1	4 0	5 8	6 11	7 9	8 0	8 0
9	9 0	8 8	7 9	6 4	4 6	2 4	0 0	2 4	4 6	6 4	7 9	8 8	9 0	9 0
10	10 0	9 8	8 8	7 1	5 0	2 7	0 0	2 7	5 0	7 1	8 8	9 8	10 0	10 0
11	11 0	10 8	9 6	7 9	5 6	2 10	0 0	2 10	5 6	7 9	9 6	10 8	11 0	11 0
12	12 0	11 7	10 5	8 6	6 0	3 1	0 0	3 1	6 0	8 6	10 5	11 7	12 0	12 0
13	13 0	12 7	11 3	9 2	6 6	3 4	0 0	3 4	6 6	9 2	11 3	12 7	13 0	13 0
14	14 0	13 6	12 1	9 11	7 0	3 7	0 0	3 7	7 0	9 11	12 1	13 6	14 0	14 0
15	15 0	14 6	13 0	10 7	7 6	3 11	0 0	3 11	7 6	10 7	13 0	14 6	15 0	15 0
16	16 0	15 5	13 10	11 4	8 0	4 2	0 0	4 2	8 0	11 4	13 10	15 5	16 0	16 0
17	17 0	16 5	14 9	12 0	8 6	4 5	0 0	4 5	8 6	12 0	14 9	16 5	17 0	17 0
18	18 0	17 5	15 7	12 9	9 0	4 8	0 0	4 8	9 0	12 9	15 7	17 5	18 0	18 0
19	19 0	18 4	16 5	13 5	9 6	4 11	0 0	4 11	9 6	13 5	16 5	18 4	19 0	19 0
20	20 0	19 4	17 4	14 2	10 0	5 2	0 0	5 2	10 0	14 2	17 4	19 4	20 0	20 0
21	21 0	20 3	18 2	14 10	10 6	5 5	0 0	5 5	10 6	14 10	18 2	20 3	21 0	21 0
22	22 0	21 3	19 1	15 7	11 0	5 8	0 0	5 8	11 0	15 7	19 1	21 3	22 0	22 0
23	23 0	22 3	19 11	16 3	11 6	5 11	0 0	5 11	11 6	16 3	19 11	22 3	23 0	23 0
24	24 0	23 2	20 9	17 0	12 0	6 2	0 0	6 2	12 0	17 0	20 9	23 2	24 0	24 0

RULE.—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to,

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 2nd, A.M., at 2 h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	20	0
Half mean spring range - - -	13	0
<hr/>		
Height above the half-tide or mean level of the sea - =	7	0
Half mean spring range - - -	13	0
By table (B) .7 ft. 0 in. gives - - - +	3	6
<hr/>		
Height of the tide above zero at 2 h. after high water =	16	6

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 8th, P.M., at 4 h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	27	1
Half mean spring range - - -	13	0
<hr/>		
Height above the half-tide or mean level of the sea -	14	1
Half mean spring range - - -	13	0
By table (B) 14 ft. 1 in. gives - - - —	7	0
<hr/>		
Height of the tide above zero at 4 h. after high water =	6	0

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 8th, P.M. at 5½ h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	27	1
Half mean spring range - - -	13	0
<hr/>		
Height above the half tide or mean level of the sea -	14	1
Half mean spring range - - -	13	0
By table (B) 14 ft. 1 in. at 5½ h. from high water -	13	7
<hr/>		
Level of the tide <i>below</i> zero - - -	0	7

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced: for example—The soundings on the chart of Liverpool are reduced to a zero 15 ft. below the mean level of the sea, whereas, the mean spring range for that place, as shown in the result of two years' observations

(1854 and 1855) of the Self-registering Tide Gauge at St. Georges Pier, being 26 ft. gives 13 ft. below the mean level of the sea;* consequently 2 ft. will have to be added to the results deduced from table (B.)

Thus, in Example I. On the chart of Liverpool 11 ft. being marked on the bar of the Victoria Channel, the actual depth over the bar at 2h. after high water would be 16 ft. 6 in. + 11 ft. 0 in. + 2 ft. 0 in. = 29 ft. 6 in.

CORRECTIONS FOR CERTAIN DOCKS, &c.†

The depth at high water on the sills of the following Docks may be known, by applying to the standard high water heights given in the foregoing Tables the annexed correction according to the sign.

				Ft.	in.
<i>Falmouth</i>	Over the Sill of Graving Dock No. 1.	-	-	2	0
	Graving Dock No. 2.	-	-	0	0
	(applied to the heights given for Holyhead.)				
<i>Devonport</i>	Over the Sill of Basin	-	-	+15	3
<i>H. M. Dockyard.</i>	South Dock	-	-	+12	5
	New Long Dock	-	-	+16	8
	Old North Dock	-	-	+4	11
	New North Dock	-	-	+5	2
„ <i>Keyham</i>	Entrance to Lock	-	-	+18	2
	Entrance to North Basin	-	-	+9	2
	No. 1 Dock	-	-	+8	2
	2 „	-	-	+5	2
	3 „	-	-	+9	2
<i>Plymouth</i>	Great Western Docks, Millbay.				
	Over the Sill of Floating Dock	-	-	+10	3
	Graving Dock	-	-	+11	9
	(applied to the heights given for Devonport.)				
<i>Portsmouth</i>	Over the Sill of No. 1 or South Dock	-	-	+6	8
<i>H. M. Dockyard.</i>	Entrance	} Basin Dock	-	+13	4
	No. 2			+10	4
	3			+12	5
	4			+13	0
	5			+6	10
	No. 6 or North Dock	-	-	+6	4
	Entrance	} Steam Basin	-	+12	2
	No. 7			+14	2
	8			+9	1
	9 at N. end of Slips	-	-	+8	1
	10 South „	-	-	+14	2
	11 Steam Basin	-	-	+14	2
<i>Portsmouth</i>	Over the Sill of the New Commercial Graving Dock	-	-	+4	10
<i>Sheerness</i>	Over the Invert at the				
<i>H. M. Dockyard.</i>	entrance	} Great Basin -	-	+9	8
	Sill of No. 1 Dock			+9	2
	2 „			+9	2
	3 „			+9	2
	No. 4 Dock	} Boat Basin -	-	+3	10
	5 „			-1	4

* The datum mark at Liverpool is the level of the Old Dock Sill. From the two years' observations above alluded to, this datum mark is 5 ft. below the half tide or mean level of the sea, and consequently 8 ft. above the zero of these Tables.

† As it is desirable that the information here given should be accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

Chatham —Over the Sill of No. 1 Dock	-	-	-	-	-	3	11
H. M. Dockyard.	"	2	"	-	-	+	3 5
	"	3	"	-	-	+	3 4
	"	4	"	-	-	+	0 5
(applied to the Heights given for London.)							
Woolwich —Over the Sill at the entrance of Outer Basin	-	-	-	-	+	3	7
H. M. Dockyard.	"			Inner Basin	-	+	1 10
	"			No. 1 Dock	-	+	2 10
	"			2 "	-	+	1 10
	"			3 "	-	+	1 10
(applied to the heights given for London.)							
Deptford —Over the Sill of Outer Dock	-	-	-	-	-	4	2
H. M. Dockyard.	"			Inner Dock	-	-	6 2
(applied to the Heights given for London.)							
London —Over the Sill of St. Katherine Dock	-	-	-	-	+	8	9
"				London Dock, Hermitage Entr.	-	+	0 10
"	"	"	"	Wapping "	-	+	3 9
"	"	"	"	Shadwell, Upper	-	+	6 2
"	"	"	"	Lower	-	+	8 10
"				Grand Surrey Dock	-	+	7 10
"				Surrey Canal and Dock	-	-	0 2
"				New Commercial Dock, Upper	}	-	1 3
				Entrance			
"				Regent's Canal and Dock	-	-	0 8
"				West India Dock, Limehouse	}	+	3 10
				Entrance			
"				City Canal or South West India	}	+	4 4
				Dock, Limehouse			
"				Commercial Dock, Upper, Lime-	}	-	0 8
				house Reach			
"	"	"	"	Lower "	-	+	7 10
"				City Canal or South West India	}	+	4 7
				Dock, Blackwall			
"				West India Dock, Blackwall	-	+	3 11
"				East India Dock	-	+	5 4
"				Victoria London Dock	-	+	8 10
Hull —Over the Sill of Humber Dock	-	-	-	-	+	4	3
Middlesbrough —Over the Sill of the Dock	-	-	-	-	+	4	1
(applied to the Heights given for Sunderland.)							
Hartlepool —Over the Sills of Victoria, West or Coal Dock,	}				+	6	8
Swainston and Jackson Docks							
(applied to the Heights given for Sunderland.)							
Sunderland —Over the Sill of Wearmouth Dock	-	-	-	-	+	6	0
"				South Dock, North Entrance	+	6	0
"	"	"	"	South Outlet,	}	+	8 0
				Inner Gates			
"	"	"	"	Outer "	+	10	0
"	No. 1.	Graving Dock	-	-	+	2	0
"	No. 2.	"	-	-	+	2	0
Newcastle-upon-Tyne —Over the Sills of Northumberland	}				+	9	4
				Dock and Basin			
"				Tyne Dock	+	10	1
(applied to the Heights given for North Shields.)							
Leith —Over the Sills of East and West Docks	-	-	-	-	+	0	7
				Sill of Victoria or New Dock	-	+	6 7
				Prince of Wales Graving Dock	+	5	0
Cardiff —Over the Sill of East Dock	-	-	-	-	-	6	2
Bute Docks.	"			West Dock	-	-	9 2
(applied to the Heights given for Weston-super-mare.)							
Pembroke —Over the Sill of Dock Entrance	-	-	-	-	+	3	6
H. M. Dockyard.							

Liverpool—

		Ft.	in.
Over the Sill of North Carriers Dock, West Passage	—	2	0
" South " West Passage	—	2	0
" Canada Half-tide Dock, W. Entrance	—	0	3
" Northern West Lock Entrance	—	2	0
" Southern West Lock Entrance	—	2	0
" " North Passage	—	5	0
" " South Passage	—	0	3
" -Canada Dock, South Passages, East	—	1	6
" " " West	—	1	6
" " Lock	—	0	3
" Huskisson Dock, East Lock	—	1	6
" " West "	—	2	0
" Sandon Dock, West Entrance	—	1	6
" Wellington Half-tide Dock, East Entrance	—	1	3
" " " West "	—	1	6
" Wellington Dock, West Passage	—	1	6
" Bramley-Moore Dock, North Passage	—	2	0
" " South Passage	—	2	0
" Nelson Dock, South Passage	—	1	6
" Stanley Dock, West Passage	—	2	4
" Collingwood Dock, West Passage	—	1	3
" Salisbury Dock, West Entrances, North	—	1	1
" " " South	—	1	1
" Clarence Graving Dock Basin, N. Passage	—	3	3
" " " S. Passage	—	3	6
" Clarence Half-tide Dock, West Entrance	—	2	6
" " Dock, West Passage	—	4	10
" Trafalgar Lock, North and South Passages	—	1	5
" " Dock, South Passage	—	3	1
" Victoria Dock, South Passage	—	3	1
" Waterloo Dock and Lock, North Passage	—	0	9
" " " South Entrance	—	0	9
" Princes Dock and Locks, North Entrance	—	0	9
" " " South Entrance	—	0	9
" Georges Dock and Passage, North Entrance	—	3	6
" " " South Passage	—	3	6
" Manchester Dock, West Entrance	—	8	3
" " Lock, West Entrance	—	4	0
" Canning Dock, West Passage	—	1	11
" " Half-tide Basin, two West En- trances, each	—	1	9
" Albert Dock, North Passage	—	1	8
" " East Passage	—	2	0
" Salthouse Dock, North Passage	—	2	0
" Wapping Basin, West Passage	—	2	0
" " North and South Passages, each	—	2	0
" " Dock, West Passage	—	2	0
" " " South Passage	—	2	0
" Kings Dock, South Passage	—	3	0
" Queens Dock Basin, West Entrances, North	—	1	3
" " " South	—	1	3
" " West Passage	—	2	0
" " South Passage	—	1	6
" Coburg Dock, West Entrance	—	2	0
" Brunswick Dock, North Passage	—	1	6
" " Half-tide Dock, East Passage	—	2	6
" " " West Entrance	—	2	0
" Toxteth Dock, West Entrance	—	3	0
" Harrington Dock, West Entrance	—	6	10
" Herculaneum, North Passage	—	0	6

Liverpool—continued :

		Ft.	in.
Over the Sill of	Herculaneum, South Passage	- 0	6
"	Garston Dock	- 2	0
"	River Craft Dock, Lock, and Eagle Basin, } Outer Gates	- 8	3
"	" " " Inner "	- 9	3
"	Duke of Bridgewater's Dock, Outer Gates	- 3	6
"	" " " Middle "	- 8	6
"	" " " Inner "	- 2	0
"	Canada Lock and Graving Dock	- 0	3
"	Huskisson Lock and Graving Dock	- 1	6
"	Sandon Graving Docks, Nos. 1 to 5, East	- 4	6
"	" " " No. 6, West	- 4	6
"	Canning Graving Docks, No. 1	- 9	9
"	" " " No. 2	- 8	0
"	Queens Graving Docks, No. 1	- 6	4
"	" " " No. 2	- 4	6
"	Brunswick Graving Docks, No. 1	- 5	6
"	" " " No. 2	- 5	6

Birkenhead—

Over the Sill of	Morpeth Dock from Morpeth Basin	- 3	0
"	Sills of Caisson between Egerton and Morpeth } Docks	- 0	6
"	Sill of Reverse Gate	- 2	6
"	Sills of Caisson between Egerton Dock and Great } Float	- 0	6
"	" " " East and West Floats	- 0	6
"	Lock from Low-water Basin into Great Float.		
	Outer Sill	+ 4	0
	Inner Sill	+ 1	0
"	Graving Dock No. 1.	- 0	6
"	" " " 2.	- 0	6
	(applied to the heights given for Liverpool.)		

Dublin—

Over the Sill of	North Wall Graving Dock	+ 6	3
"	Old Custom House Dock	+ 3	5
"	Georges Dock	+ 5	5
"	Camden Lock of Grand Canal Dock	+ 7	0
	(applied to the heights given for Kingstown.)		

Londonderry—

Over the Sill of	Graving Dock	+ 6	9
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TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or - to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

[NOTE.] In the tables from 1850-1858 the Constants for the height were given for such places only where the curves for the place and the standard port were similar, the Constant being the difference between the whole rise at the two places. But as that arrangement, which at times referred necessarily to a standard port on a distant part of the coast, appears to have confused the mariner, he is now referred to the standard port in the locality of the required place, which although the result deduced thereby may not be strictly accurate, yet it is sufficiently near for practical purposes.

COAST OF IRELAND	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundstone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
" Strangford Quay	+ 1 21	..	"
" Carlingford (Bar) or Cranfield Point	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	.	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
St. Ives	— 2 10	..	Weston-super-mare.
Padstow	— 1 41	..	"
Lundy Island	— 1 39	..	"
Barnstaple Bar	— 1 24	..	"
Ilfracombe	— 1 12	..	"
Bridgewater Bar	— 0 4	..	"
Portishead	+ 0 22	..	"
Bristol (King Road)	+ 0 2	..	"
Cardiff	+ 0 5	..	"
Swansea (Mumbles Lighthouse)	— 0 11	..	Pembroke.
Llanelly	+ 0 4	..	"
Tenby	— 0 12	..	"
Milford Haven (entrance)	— 0 20	..	"
Fishguard, Goodic Pier	— 3 15	— 4 5	Holyhead.
Cardigan	— 3 10	..	"
Aberystwyth	— 2 40	— 3 0	"
Aberdovey	— 2 11	..	"
Barmouth	— 2 31	..	"
Pwllheli	— 2 25	..	"
Bardsey Island	— 2 31	..	"
Porth-dyn-lleyn	— 1 41	..	"
Czernarvon	— 0 38	— 2 3	"
Beaumaris	— 0 51	— 4 7	Liverpool.
Port Fleetwood (Wyre Lighthouse)	— 0 12	..	"
Poulton-le-Sands	+ 0 3	+ 1 3	"
Whitehaven	— 0 9	— 2 9	"
St. Bees Head and Port Har- rington	— 0 18	..	"
Workington	— 0 19	..	"
Maryport	— 0 20	..	"
Abbey Head	— 0 13	..	"
Southernness	— 0 3	..	"
Annan Foot	+ 0 33	..	"
Port Carlisle	+ 0 47	..	"
Douglas, Isle of Man	+ 1 1	..	Holyhead.
Ramsey	+ 1 1	+ 3 3	"
Peel	+ 0 57	+ 0 3	"
Tarn Point, Solway Firth	— 0 1	— 2 11	Liverpool.
Port Patrick	— 0 58	..	Greenock.
Loch Ryan	— 0 56	..	"
Lamlash	— 0 19	..	"
Campbellton	— 0 23	..	"
Ayr	— 0 18	— 1 0	"
Ardrossan	— 0 23	..	"
Largs	— 0 18	..	"
Inverary	— 0 2	..	"
Port Glasgow	+ 0 10	..	"
Glasgow	+ 1 17	..	"
Crinan	+ 4 41	..	"
Tobermory, Isle of Mull	— 2 52	..	Thurso.
Portree, Isle of Skye	— 1 56	..	"
Loch Inver	— 1 47	..	"
Kyle Akin	— 2 12	..	"
Tanera, Summer Isles	— 1 51	..	"
Stornoway, Isle of Lewis	— 1 42	..	"
Cape Wrath	— 0 58	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Stromness	+ 0 32	..	Thurso.
Lerwick	+ 2 2	..	"
Wick	- 2 55	..	Leith.
Dornock Road	- 2 17	..	"
Cromarty	- 2 21	..	"
Inverness	- 1 59	..	"
Banff	- 1 49	..	"
Peterhead	- 1 43	..	"
Aberdeen	- 1 17	..	"
Stonehaven	- 1 7	..	"
Montrose	- 0 52	..	"
Arbroath	- 0 42	..	"
Tay Bar	- 0 11	..	"
Broughty Ferry	+ 0 5	..	"
Dundee	- 0 50	+ 0 2	Sunderland.
Dunbar	- 1 14	0 0	"
Berwick	- 1 4	..	"
Holy Island	- 0 52	..	"
Blyth	- 0 7	..	"
Tynemouth Bar	- 0 2	..	"
Seaham	+ 0 2	..	"
Hartlepool	+ 0 6	+ 0 8	"
Whitby	+ 0 23	..	"
Scarborough	+ 0 49	+ 1 5	"
Filey Bay	+ 0 58	..	"
Flamborough Head	- 1 59	..	Hull.
Bridlington	- 1 50	..	"
Spurn Point	- 1 3	..	"
Great Grimsby	- 0 53	- 1 8	"
Lynn and Boston Deep	- 0 29	..	"
Wells Bar	- 0 9	..	"
" Harbour	+ 0 31	..	"
Blakeney Bar	+ 0 1	..	"
Yarmouth Road	- 2 51	..	Harwich.
Lowestoft	- 2 9	..	"
Orfordness	- 0 51	..	"
Nore	- 0 7	..	Sheerness.
Chatham	+ 0 25	..	"
Gravesend	- 0 57	..	London.
Woolwich	- 0 28	..	"
Greenwich	- 0 24	..	"
London Docks	- 0 10	+ 0 4	"
Margate	- 2 27	..	"
Ramsgate	- 2 23	- 4 1	"
Deal	+ 0 3	..	Dover.
Folkstone	- 0 5	..	"
Dungeness	- 0 27	..	"
Rye Bay	+ 0 8	..	"
Hastings	- 0 19	..	"
Beachy Head	+ 0 8	..	"
Newhaven	+ 0 39	..	"
Shoreham	+ 0 22	- 1 2	"
Littlehampton	- 0 5	..	Portsmouth.
Selsea Bill	+ 0 4	..	"
Bembridge Point	- 0 41	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Southampton	— 1 11	..	Portsmouth.
West Cowes	— 0 56	..	"
Hurst Camber	— 1 41	..	"
Needles Point	— 1 55	..	"
Christchurch	— 2 41	..	"
Poole	— 2 31	..	"
Portland Breakwater	— 4 40	— 5 10	"
Lyme Regis	+ 0 38	..	Devonport.
Exmouth	+ 0 38	..	"
Torbay	+ 0 17	..	"
Dartmouth	+ 0 33	..	"
Plymouth Breakwater	— 0 6	..	"
East Looe	— 0 17	..	"
Fowey	— 0 29	..	"
Falmouth	— 0 46	..	"
Penzance	— 1 13	..	"
Scilly Isles (St. Mary)	— 1 16	..	"
WESTERN COAST OF EUROPE.			
Gibraltar	— 1 27	..	Brest.
Cadiz	— 2 2	..	"
Lisbon (Bar)	— 1 17	..	"
Oporto	— 1 17	..	"
Ferrol	— 0 47	..	"
Santander	— 0 17	..	"
Bayonne	— 0 2	..	"
Arcachon	+ 0 50	..	"
Tour de Cordouan	— 0 10	..	"
Bordeaux	+ 3 3	..	"
Ile d'Aix	— 0 27	..	"
Ile d'Yeu	— 0 41	..	"
Ile de Noirmoutier	— 0 45	..	"
Port Navalo	— 0 5	..	"
St. Nazaire	— 0 7	..	"
Belle Ile	— 0 29	..	"
Port Louis	— 0 36	..	"
Port Concarneau	— 0 35	..	"
Ile de Sein	— 0 26	— 1 9	"
Ouessant (Ushant)	— 0 15	— 0 1	"
NORTHERN COAST OF EUROPE.			
Abervrach	+ 0 27	..	Brest.
Morlaix	+ 1 6	..	"
Plongrescan	+ 1 30	..	"
Bréhat	+ 2 4	..	"
St. Malo	+ 2 18	..	"
Granville	+ 2 26	..	"
Ile de Chausey	+ 2 22	..	"
Jersey (St. Helier)	+ 2 38	..	"
Guernsey (St. Peter Port)	+ 2 50	..	"
Érrehous	+ 2 45	..	"

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	..	Brest.
Cherbourg	+ 4 2	..	"
Barfleur	+ 5 4	..	"
La Hougue	+ 4 55	..	"
Honfleur	+ 5 42	+ 4 3	"
Quillebœuf.	+ 6 19	— 9 7	"
Havre	+ 6 4	..	"
Fécamp	+ 6 57	+ 4 2	"
Dieppe.	+ 7 19	..	"
Cayeux	+ 7 18	..	"
Boulogne	+ 0 13	..	Dover.
Cape Grisnez	+ 0 15	+ 2 4	"
Calais	+ 0 37	+ 0 10	"
Dunkerque.	+ 0 56	..	"
Nieuport	+ 1 6	..	"
Ostend.	+ 1 13	..	"
Flushing	+ 2 8	..	"
Antwerp	+ 5 13	..	"
Hellevoetsluis	+ 3 18	..	"
Rotterdam	+ 4 33	..	"
Helgoland	— 0 33	— 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N.W. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North, till at the last 4½ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At 3¼ hours ebb on the shore it sets W.S.W.; at 4 hours W. by N.; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E.; and then E.N.E and E. by N. till about high water, when its direction is E. by S.

From Bolt Tail to Start Point, at $\frac{1}{4}$ miles off shore, the eastern stream makes at 3 hours after high water, and the western stream 3 hours after low water on the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is irregular, varying from 4 to 7 hours after high and low water on the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off the Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about $4\frac{3}{4}$ hours. The direction of the western stream for the first 2 hours is W.S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is E.N.E.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 10h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, or until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

In West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{1}{4}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{3}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour N.N.E. to E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of the flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S S.E., 2 knots.

At $2\frac{1}{4}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{4}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E.N.E. $\frac{3}{4}$ E., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{3}{4}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W.S.W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W.S.W. $\frac{3}{4}$ W., $1\frac{1}{4}$ knots. N.B.—About a mile south of the Bill, at half flood, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots. 2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. The 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, about west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 4h. 45m.: the flood and ebb are of equal duration, the former setting S.E., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern or flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{3}{4}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{3}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{3}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W.S.W. $\frac{1}{2}$ W. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part, W. $\frac{3}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton-water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{2}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high waters occur on either shore of the Solent, as shown in the times of high water, at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour, with a rise and fall of 3 or 4 inches for another hour, and only rises and falls $\frac{1}{2}$ inch for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the docks on the same tide.

somewhere near the Light Vessel; for instance, at the 1st hour's flood by the shore it sets East; 2d and 3d hours, E.N.E.; 4th, N.E.; 5th, N.E. by N.; 6th, North; 7th, N.N.W. to N.W.; and the last drain of the flood, N.W. by W. The 1st hour's ebb sets W. by N.; 2d W. by S. to W.S.W.; 3d, S.W. by W. to S.W.; 4th, S.W. $\frac{1}{2}$ S., the first part of the 5th hour, S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2 o'clock, and runs $7\frac{1}{2}$ hours about S.S.E.; and the western stream at 9h. 30m., and runs nearly $4\frac{1}{2}$ hours N.N.W.

Near the Horse Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2 o'clock, $2\frac{1}{2}$ hours after the tide on the shore, and runs to the S.E. $7\frac{1}{4}$ hours; the western stream makes at 9h. 15m., $4\frac{3}{4}$ hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2 o'clock, runs to the S.E. for 2 hours, and then sets east for the remainder of the tide, $5\frac{1}{2}$ hours; the western stream makes at 9h. 45m., and runs W.N.W. $4\frac{1}{4}$ hours.

At Spithead, at full and change, the eastern stream makes about 2 o'clock, $2\frac{1}{2}$ hours after high water in the harbour, and runs 7 hours S.E. by S.; and the western stream about 9 o'clock, $2\frac{1}{2}$ hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about seven hours, and a narrow stream runs in, fifteen or twenty minutes after high water at the Dock-Yard. From the result of three years' observations taken at the Dock-Yard it appears that at high water, slack water at springs continues for eight minutes, and at neaps sixteen minutes.

Looe Stream. At the western entrance near the Pullar Buoy, at full and change, the eastern stream makes at 3h. 45m., and the western stream at 10 hours, and sets S.E. and N.W. Between 2 and 3 miles outside of the Boulder Bank, the stream turns about an hour later; the eastern stream setting E.S.E. and the western stream west. Between the Pullar Bank and the Middle Owers, the eastern stream sets E.S.E. and the western stream west. At the eastern entrance, near Eastborough Head, the eastern stream makes at 4h. 30m., and sets E.N.E. $\frac{1}{2}$ E., and the western stream at 9h. 50m. west. Off the west end of the Hooe Bank, the eastern stream makes at 4h. 35m. and sets E.S.E., and the western stream at 10h. 30m. W. $\frac{3}{4}$ N.

About 1 mile S.S.E. of the South Foreland Lighthouse, the stream begins to set to the eastward about 1h. 30m. before high water on the shore at Dover, and runs from N.E. by E. to E.N.E. about $5\frac{1}{2}$ hours, or till 4 hours after high water: it then turns and sets W.S.W. $\frac{1}{4}$ W. about 7 hours. At Dover the flowing stream very seldom continues more than 5 hours, and sometimes scarcely so much; it is nearly the same at Ramsgate. To the northward of the South Foreland the streams change their direction to N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S.

In the Downs the north-eastern stream begins about 1h. 20m. before high water at Dover, and continues to run 5h. 30m.: it then turns and runs in a contrary direction till 2 hours before the ensuing high water.*

In the Gull Stream, 1 mile N.N.W. from the Bunthead, the northern stream begins about 1h. 10m. before high water at Dover, and continues for 6 hours: it then turns and runs in a contrary direction till $1\frac{1}{2}$ hours before the ensuing high water. Its direction is N.E. $\frac{3}{4}$ N.; but the last hour changes to E.N.E., and even to the southward of East; the last hour of the southern stream changes from S.W. $\frac{3}{4}$ S. to W.S.W., and even to the northward of West.

* For the tides at the Southsand Head and Northsand Head of the Goodwin, see Compartment VI.

TIDES ON THE EAST COAST OF SCOTLAND AND ENGLAND.

In the North Sea the flood tide-wave enters from the Atlantic Ocean between the coast of Norway and the British Isles, and passes through the various channels formed by the Shetlands, the Orkneys, and the north point of Scotland. The average rate of the stream in the offing is very moderate, not exceeding a knot and a half; but that part of the stream which enters by the Pentland Firth acquires a furious rapidity, amounting at spring tides even to eight knots. Immediately on quitting the Firth, however, it abates in strength, as it diverges into open water; its eastern branch filling up the basin of the North Sea as it advances towards the coast of Jutland and Holland; whilst its western branch, more or less confined by the Dogger and other outlying banks, swells along the shores of Scotland and England, and makes high water in all their rivers and harbours successively till it arrives in the Thames.

The following remarks will assist the seaman in tracing the movement of the tide stream along the coast :—

Off Clythness and Ord Head its rate is about 3 knots at the springs and $1\frac{1}{2}$ with the neaps, and continues to run to the southward till 11 o'clock, or till 3h. 40m. before high water at Leith. Off Covesea Point, Burgh Head, and thence westward towards Fort George and Cromarty, it runs about an hour longer.

Off Cullen the flood stream sets slowly to the eastward, increasing in velocity as it advances: off Troop Head it runs till 1 o'clock, or till 1h. 20m. before high water at Leith; off Kinnaird Head it attains the rate of 2 knots on springs, and is still accelerated as it passes Rattray Brigs till off Peterhead, which is occasioned by the junction of the direct stream from Duncansby Head. Six miles off Kinnaird Head the stream runs to the southward till 2, and at 12 miles till 3 o'clock, or till 40 minutes after high water at Leith.

Off Buchanness the stream attains its greatest strength, namely 4 knots on the springs, and $2\frac{1}{2}$ on the neaps; but off Newburgh it decreases to less than 2 knots, and ceases at 2 o'clock; and at 4 or 5 leagues in the offing it runs till 3 o'clock, or 40 minutes after high water at Leith.

The stream runs past Girdleness till 2h. 30m., or 10m. after high water at Leith; springs at the rate of $2\frac{1}{2}$, neaps $1\frac{1}{2}$ knots. It runs across the mouth of Montrose Harbour and past Red Head till 3 o'clock, or 40 minutes after high water at Leith. From Red Head it sets into St. Andrews Bay till the last quarter, which sets S. and S.S.E.; but to the westward of Red Head it sets W.S.W. past Arbroath and over the Tay Bar.

At 2 miles without the Bell Rock Lighthouse the flood continues running to the southward till 2h. 55m. after high water at Leith; but between the Bell Rock and Fifeness it changes 2 hours earlier. The first part of the latter stream sets towards May Island, the middle to the South, and the last part S.S.E. The first part of the ebb sets from E.N.E. to N.E., the middle N.N.E., and the last part more northerly.

About a mile off St. Abbs Head the flood stream runs to the south-eastward till 2h. 55m. after high water at Leith; but at $5\frac{1}{2}$ or 6 leagues in the offing it continues a quarter of an hour later. About 3 miles off Berwick it runs till 4h. 10m. after high water at Leith.

At 5 miles off North Sunderland Point, and at the same distance south-eastward of the Staples, the flood stream continues till 3h. 25m. after high water at Leith.

About 2 miles off Blyth Harbour, and 4 miles off Tynemouth, it runs to the southward till 3h. 40m. after high water at Leith; and at 4 miles off Sunderland, a quarter of an hour later.

At 3 or 4 miles off Hartlepool, and at the same distance off Whitby the flood stream runs to the southward till 4h. 10m. after high water at Leith; and at the same distance off Flamborough Head it continues to run half an hour longer.

Near the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 9 o'clock, or three hours after high water on the shore.

Four miles off Cromer, and the same distance off Hasborough, the flood stream runs along shore to the southward till 10h. 15m., or 1h. 45m. before high water at Harwich, and the ebb in a contrary direction.

At 2½ miles off Lowestoft the flood stream continues to run to the S.S.W. till 1h. 30m. before high water at Harwich.

At Orfordness the flood stream continues to run till about high water in Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

At Margate it is high water about 11h. 40m. by the ground. Near the East buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 9h. 15m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, and increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished velocity, till at low water it falls slack at south.

In the River Medway the flood stream runs up in mid-channel from twenty to twenty-five minutes after high water at Sheerness Dock-Yard; but at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the Thames for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the times and the heights of high water. Thus in the North Sea a strong N.N.W. gale and a low barometer raise the surface 2 or 3 feet higher, and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times and heights predicted in the Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Portland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, to the southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed further south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY CAPTAIN F. W. L. THOMAS, R.N.

THE great rapidity of the tidal streams among the Orkneys makes a correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

In the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick smoke; upon the open coast the sea rises at once, and striking upon the rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsà.

*Depth of the
Tidal Stream.*

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these rippings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time; the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentland Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick gives 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

Difference of

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appeared that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fail while the flood is running, there would be a great probability of drifting ashore.

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

stream off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa and North Ronaldsha 3 knots; but near North Ronaldsha the rate again increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one with a small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry,
Röst.
North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the flood having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2·8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long oval, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed upon a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood tide; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Trevan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely bad *röst* off the Start with southerly winds and flood tide; it stretching 3 or 4 miles to sea, but being heaviest near the shore.

*Start of Sanda.
Röst.*

Between Westra and Sanda the stream is scarcely sensible, but gathering strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Stronsa Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before it is low water on the shore, or $1\frac{3}{4}$ hours before it is low water in the stream, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

* *Röst* (pronounced reust) a Scandinavian word, meaning a roaring, broken, tidal sea.

- the narrows when passing Spur Ness, but it speedily becomes diffused in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.
- Stronsa and Westra Firths.* In the Stronsa and Westra Firths, which form one continuous and nearly straight channel, the tide stream is very rapid, as through them and Enhallow Sound the body of the ocean tide is discharged.
- North Shoal.* At the North Shoal, which is 15 miles from the entrance of the Firth, the tide sets W. by S. (towards the entrance), and at springs scarcely runs 2 miles an hour; neaps about one.
- Brough of Birsa.* Along the coast of West Mainland, or Pomona, the stream is only sensible off the points; but off the Brough of Birsa the flood stream sets to the northward for two hours after it is high water on the shore. when its greatest rate is 2 knots.
- West coast of Rowsa.* From the Brough of Birsa the flood sets along shore for Costa and Sacquoy Heads, increasing in velocity as it approaches the Westra Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of Quendale.
- Skea Skerries.* The flood stream runs South along the West coast of Westra, from the Noup to the point of Skea, and over the Skea Skerries. Between them and Rowsa the stream acquires great force, even 6 knots, and does not turn for two hours after high water on the shore. Its chief weight passes close round Kili Holm, and crosses for War Ness, (the South Point of Eda,) and the Greenholms.
- Kili Holm. War Ness.* At War Ness the tide stream runs 7 knots, and the röst is quite impassable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in violent commotion, and when bound to Stronsa, a line of breakers may sometimes be seen roaring and foaming within half a cable's length, while vainly looking for a gap or smooth.
- Stronsa Firth.* The main stream from War Ness, joined by the Stream from Eda Sound, sets past Rousholm Head, and clear of Auskerry to the open sea; and from the Greenholms, past Shapinsha and Deerness, where it is joined by the String, the usual name for the direct run of the stream from Eynhallow Sound by Gairsa, Eller Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Deerness and Auskerry about 4 knots.
- Weatherness and Fara Ness Sounds.* The tides in Weatherness and Fara Ness Sounds are peculiar; the stream turns to the eastward as soon as the tide has ceased to fall upon the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it does in Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets very weakly towards Calf Sound.
- Egilsha and Shapinsha.* A very weak stream runs south through Howan Sound during the flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.
- Sound.* The flood stream from Costa Head and the reef of Quendale runs towards Eynhallow, and divides there, passing Burgher and the Wael Race at the rate of 7 knots; the streams unite when past the island, but do not average more than 4 knots down Eynhallow Sound.
- Wyre Sound. Swine Holm.* A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the latter stream unites with that from the Westra Firth, the rate scarcely equals 2 knots. In the narrow channels among the group of Holms between Gairsa and Shapinsha, the flood sets southerly 6 knots.
- Between Gairsa and Shapinsha*
and by Work Head. The main stream from Eynhallow Sound passes S. of Gairsa and thence transversely to Stromberry Head, and on through Shapinsha Sound. The tide stream is narrow in its passage between Work Head and Eller Holm, nor does the *String* expand for some distance after

passing that place ; the rate at springs is about 3 knots, and the stream does not turn till 1½ hours after high water on the shore.

The flood-stream running through Hoy Sound commences on the North Side at the Millstone Quarry, 4 miles from Hoy Mouth, and on the South from Hoy Head; the indraught is scarcely felt 5 miles outside the entrance.

Hoy Sound.

In Hoy Mouth the rate of the stream is 4 knots, until it divides upon Gremsa, when the rate increases to 6 knots; one stream passing through Burwick Sound, the other between Gremsa and Stromness. The tide goes over the Skerry Ness, and from thence sets fair for the Skerries of Clestron, where it divides, one stream running up and filling the Bay of Ireland, and at half flood setting as a back-tide out of Cairston Road; the other setting rather off shore at first, and then towards Houton Head. From Burwick Sound the stream sets along the shore of Hoy to Green Head, the rate being scarcely 3 knots; and Gremsa causes a large arrear of slack water in the middle of the Sound.

Burwick Sound.

After passing Houton Head, the flood stream becomes diffused in Scapa Flow, and is only sensible off that point; its general direction is towards Holm Sound, and at the Barrel of Butter it scarcely runs 2 knots at springs. On the West side of Holm the stream drains along shore to Halcrow Head, where it meets the stream from the Pentland Firth.

Houton Head.

Scapa Flow.

The tide stream runs with greater velocity and turbulence through the Pentland Firth than in any other part of the Orkneys; so that with a strong gale and a weather spring-tide the sea is in many places impassable, and after the wind has gone down, the sea continues to break with great violence for some days, indeed in a sailing ship more danger is to be apprehended from a calm than from a gale of wind. The tide wave from the Atlantic, opposed by the West coast of the Orkneys, is pressed against the shores of Caithness, where at Thurso the tide rises nearly 5 feet higher than at Stromness, though the latter is but 20 miles to the northward. This accumulated mass of water finds egress through the Pentland Firth, where the velocity of the stream near the Little Skerry was said by Captain Otter to have acquired the rate of 10 knots. At the Great and Lothar Skerries, which resist a large body of the tidal stream, the water is sensibly higher by 1 or 2 feet upon the stream side, and a small rapid is formed, of little height indeed, but of great power. Vessels that have drifted upon this rock, when covered by the tide, have been rolled over it, and sunk in deep water on the other side.

Pentland Firth.

The establishments of the following places in the Pentland Firth were determined by Captain Otter:—

Establishments.

PLACES.	High Water.		Rise above the mean level of L.W. ordinary Springs.		Range, or Rise between L.W. and H.W.		REMARKS.
	h.	m.	Spring.	Neap.	At Springs.	At Neaps.	
Thurso, Scrabster Road.	8	28	13 3	9 6	13 3	5 9	Deduced from 4 years' observations. Mean of 19 comparisons, but very irregular. Mean of 12 comparisons with Thurso.
Duncansby Ness	10	14	8 6	6 0	8 6	4 0	
Stroma, South Side	9	47	7 6	6 0	7 6	4 0	
Swona, East Side	10	24	-	-	-	-	Mean of 33 comparisons with Thurso.
West Side	9	33	-	-	-	-	
Pentland Head, Great Skerry, East Side	11	4	7 9	6 6	7 9	3 0	
Great Skerry, West Side	10	33	-	-	-	-	Mean of 7 comparisons with Thurso.
Widewall	9	3	-	-	-	-	

The directions as well as the velocities of the tidal streams in the Pentland Firth vary with the hour of the tide; and in almost every case the flood takes a more southerly direction as the tide grows older, and the contrary with the ebb.

Rate. The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching the entrance. Between Turn Ness and Dunnet Head the usual springs rate is 7 knots, but as they round the South end of Swona and North end of Stroma, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore, the flood stream makes strong along the coast of South Walls, and curving to the northward of Swona, washes the Great Lothar, and passes to the northward of the Pentland Skerries.

Direction. At a later period of the tide, the stream from Brims Ness goes direct to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she will pass a mile to the southward of Swona, and the same distance to the southward of the Skerries.

Hoxa Sound. From Cantick Head the flood stream sets past Stangar Head, and crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other runs about 4 knots towards Water and Holm Sounds.

Holm Sound. Through Holm Sound the rate of the stream is 6 knots where strongest, and it turns at one hour after it is high water on the shore. The rate through Water Sound is 4 knots.

Water Sound. From Cantick Head a weak stream runs northwards, filling Long Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest part of these Sounds is 2 knots.

Cantick Sound. Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Swona; but it is almost impossible to predict exactly what direction a drifting vessel would take; with Barth Head open North of Swona, the first quarter flood would send her to the northward of that island, and through the mid-channel between it and South Ronaldsha; but the half flood would probably press her too close to Barth Head, and perhaps on the Great Lothar.

East side of Hoy. The first of the flood stream from Widewall sets direct on Barth Head and the Lothar, so that in light winds vessels should in all cases pass as near to the North Head of Swona as possible. As a general rule, if a ship, having left Widewall with light winds and flood tide, should drift nearer to Swona than Barth Head, she will be likely to clear the Lothar—if nearer to Barth Head, she will go too close to that rock.

Pentland Firth; round Swona ; When the flood stream first makes at the north head of Swona, it first sets across the channel, but presently turns to the southward, passing clear of the Lothar, and then to the northward of the Pentland Skerries; but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide, sets towards them.

Pentland Skerries. Between the Lothar and the Skerries the flood stream sets fair out to sea, about E.S.E., joining the main stream from Stronsa Firth.

From the South end of Swona the first flood sets right on the Great Skerry, dividing there, and running 7 knots close to the North rocks. On the South side the stream sets off (leaving a narrow eddy inside), at first towards the Little Skerry, but it gradually curves and goes clear of

the Clette. A vessel, however, must be very near the Great Skerry to drift in that direction; if only half way between the Great and Little Skerries she would infallibly drive upon the rocks, where the current runs like a mill-stream. It must be observed, that the general tendency of the flood-stream is to set clear to the westward of the Skerries, and that a vessel must be very near the opening between the Great and Little Skerries before she would feel its indraught. After half tide in the stream, the set of flood from Swona goes well clear to the southward of the Pentland Skerries.

I cannot state with the same personal confidence the direction of the streams of tide on the South side of the Pentland Firth, but the experiments of Capt. Otter show that the flood stream from Dunnet Head and St. Johns Point has a tendency to pass to the northward of Stroma, so that a buoy set adrift within half a mile of Mey Bay will not float through Inner Sound, but rather drift on shore on the west side of Stroma; and from this it would appear that a vessel one mile to the northward of Dunnet Head, with strong flood, will go well clear to the northward of Swona.

Inner Sound.

The last of the flood stream is pressed down upon Duncansby Head, where it does not cease running till 4 hours ebb on the shore; for which reason, when a vessel is turning up from the southward, she should rather endeavour to enter the Firth upon the North side, when she will usually be able to get as far as Brough Ness while the flood is still running.

Duncansby Head.

There are large eddies under Stroma and Swona with the flood, and where they meet the main stream little whirlpools are produced, which credulity has exaggerated into objects of importance; on rare occasions they might be dangerous to boats.

Eddies of Swona and Stroma.

It is almost still water to the eastward of the Skerries during flood, and a large eddy is formed between the Great Lothar and Old Head, commencing at half-flood on the shore; it is called Liddel Eddy, from a farm of that name in South Ronaldsha.

Eddies of Pentland Skerries; and Liddel Eddy.

Wherever the tide stream is rapid past any point there is always an eddy on the opposite side, and these eddies increase as the tide grows older, till at last only a narrow stream of the former tide is left; this may be well witnessed in Hoy Sound, where the flood stream is sometimes diminished by the encroaching ebb to 20 and 30 feet in breadth.

The indraught of the ebb stream to the Pentland Firth is felt at a considerable distance from the entrance, so that vessels leaving the Mull of Deerness in calm weather are sometimes drifted into the Pentland Firth. From Copinsha the stream runs nine hours to the southward, from half flood on the shore to low water; but its rate is slow, never exceeding 2 knots, except near Old Head, where it runs four.

Ebb stream,

There is not much danger to be apprehended from the ebb stream in the Pentland Firth when it has made strong; about 3 hours after low water on the shore, it sets fairly through between Duncansby Head and the Skerries, between Swona and Stroma, and over towards Hoy; and a vessel must be far within a line joining Duncansby Head and the North end of Stroma, to feel the indraught of the Inner Sound; for a buoy that has drifted through that Sound with the flood stream will not return with the ebb.

in the Firth.

Inner Sound.

Round Brough Ness the ebb pours with great violence, and over the tail of the Great Lothar, where several vessels have thereby been lost.

Great Lothar.

The stream from the North side of the Pentland Skerry sets upon Swona, dividing upon the South Clette; but the last part of the ebb will go to the northward, between Barth Head and Swona.

Swona.

From the North Head of Swona the first ebb goes towards Brims Ness, the last towards Switha. There is a very large eddy under Swona

Eddy.

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and incloses a large eddy; at half tide these united streams set over toward Turn Ness, where the last of the ebb tide drains, while there is comparatively still water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of the several streams, can learn from the chart.

REMARKS ON THE SET OF THE TIDAL STREAMS IN THE IRISH AND ENGLISH CHANNELS, AND IN THE NORTH SEA.—BY REAR-ADMIRAL F. W. BEECHEY, F.R.S.

*The Common
Standard for
the turn of the
Streams*

A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water along the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover; and to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.); and it is only necessary to mention here, that to the southward of the parallel of Scilly, the tides of the Channel and offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to make the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of their course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolving motion of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, yet directly she is loose she will be carried away upon a rhomb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is more regular, and while the water is *falling* at Dover, will be found setting to the *northward*: near the coast partaking of the direction of the shore, and turning sharply round Trevoze Head and Hartland Point into the Bristol

Channel; and while the water is *rising* at Dover, setting as sharply out of the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; and at Trevoise Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; at present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about the parallel of $51^{\circ}00$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versa*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is falling at Liverpool, and *vice versa*. To the westward of this line the tides appear to be slack; but we are in want of further observations in all this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west round Cape Clear, and *vice versa*.

Seven Stones.

Meeting of the
Stream in
 $51^{\circ} N$.

Streams between
Scilly and
Tuskar.

Off S. coast of
Ireland.

At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, and N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versa*, as before stated. The *entrance of* Liverpool is properly the standard to which the turn of the stream in these pages is referred, and wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges Pier, to which the tide tables are adapted.

Off the Smalls.

On the Irish side, at the Saltees Lightship, for instance, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{2}$ hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. for the last hour, when the tide slackens, as before, 22 minutes before high water at Liverpool entrance.

Off the Saltees.

From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore
Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE WHEN AT THEIR GREATEST STRENGTH.

Streams turn with the tides of Liverpool and Morecambe Bay.

IN the Irish Channel, as before observed, experiments have shown that, notwithstanding the variety of times of high water throughout the Channel, the turn of the stream over all that part which may be called the fair navigable portion of the Channel is nearly simultaneous; that the northern and southern streams in both Channels commence and end in all parts (practically speaking) at nearly the same time; and that that time happens to correspond nearly with the time of high and low water on the shore at *the entrance* of Liverpool and of Morecambe Bay,* a spot remarkable as being the point where the opposite tides coming round the extremities of Ireland terminate. So that it is necessary only to know the times of high and low water at either of these places, to determine the hour when the stream of either *tide will commence or terminate in any part of the Channel*. For this purpose the Liverpool tide-table may be used, subtracting 18 minutes from the times there given, in consequence of the high water at St. Georges Pier being later than the point which is considered as the head of the tide, and which will be found fully explained at page 125.

Streams enter N. and S. of Ireland.

The tide from the Atlantic enters the Irish Channel by two channels; of which Carnsore Point, the S.E. point of Ireland, and St. Davids Head, the S.W. point of Wales, are the limits of the southern one; and Rathlin and the Mull of Cantyre the boundaries of the northern.

Southern streams from Tuskar to the Isle of Man.

The *central portion of the stream* of flood or *ingoing* stream, runs nearly in a line from a point midway between the Tuskar and the Bishops, to a position 16 miles due west of Holyhead; beyond which it begins to expand eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes to the eastward with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it is arrested by the flood or southern stream from the North Channel coming round the Point of Ayr, and is first turned round to the eastward by it, and then goes on with it at an easy rate direct for Morecambe Bay; thus changing its direction nearly eight points.

Eastern Branch of S. stream sets into Cardigan Bay.

The *outer portions* of the stream are necessarily deflected from the course of the great body of the water by the impediments of banks on the Irish side of the Channel, and by the tortuous form of the coast on the Welsh. The eastern portion passing Linney Head, rushes with great rapidity between the Smalls, Grassholm, and Milford Haven towards the Bishops, which it passes at a rate of between 4 and 5 knots; sets sharply round those rocks in an E.N.E. direction right over the Bass Bank, and into Cardigan Bay; makes the circuit of that Bay, and sets out again towards Bardsey, at the other extremity of it; then sweeping to the N. by W. past the island and through the Sound, it gradually takes the course of the shore, round Caernarvon Bay, filling the Menai Strait as far as Bangor; but the stream still continuing outside towards the South Stack, which it rounds, setting towards the Skerries at a rate of upwards of 4 knots; and, finally, turns sharp round those rocks for

* The entrances of Liverpool and of Morecambe Bay are, as before stated, 18 minutes earlier in their times of high water, than those given for Liverpool in the tide-tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the ebb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

Western Branch sets over the Irish banks.

Off Arklow, no rise or fall.

Codling Bank.

Stream ends off Carlingford. No stream there.

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 20 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

Northern Stream from Rathlin to the Clyde.

The *central portion* midway between the Mull of Galloway and the Copeland Island presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

Central portion of this stream sets to Isle of Man and Morecambe Bay.

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

Western branch of N. stream to Maidens and Belfast.

dangerous group; and takes the direction of the coast again from Muck Island to Black Head, at the entrance of the Lough of Belfast, which it fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough splits off Grey Point; one portion flowing up towards Garmoyle, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. John's Point; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed, although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams. These observations do not, however, extend beyond the points where the Channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left; that on the north joining the stream from Jura, and turning sharp round Rathlin; that on the south, speaking now of the outgoing stream, sweeps past St. David's Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

TABLE SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.

In the following Table, the direction of the stream as it runs at the middle of the tide or at its greatest strength, is given at four places upon lines connecting well known headlands, viz., at 5 miles from the shore, on each side of the channel, and at a third of the distance across the channel from each of those headlands. The names of the places will be found in the marginal columns; and in the adjacent column, a brief description of the course of the streams in the immediate vicinity of each headland. The western part of the stream will be found on the left-hand page, and the eastern half on the right-hand page. *Explanation.*

To use the table, take the line nearest to your position, and at the distance across the Channel which answers best to your distance from the land, take out the direction of the stream from its column; or if the place of the ship falls between two divisions, take the mean of the two directions given in the columns for the direction of the stream at that time. To know when the stream will turn, look in the Tide Tables for the time of high water at Liverpool, for the day, and about 15 minutes after that time the stream will begin to *set out* in both the North and the South Channels, and will run in that direction until about 45 minutes before low water, when the general slack water begins. The slack water in the offing is usually spread over an interval of an hour—from the cessation of one stream to the beginning of the next.

In these tables { F stands for *flood* or *rising* tide at Liverpool.
E stands for *ebb* or *falling* tide at Liverpool.

As a rough general rule, in the fair way of the Channel a vessel will be carried 9 miles by the stream in a whole tide at springs, and at neaps about 6 miles; but near to the land on either side, or to the banks, the rate of the stream greatly increases.

The rates given in the table which follows are at spring tides; and in order to adapt them to neaps, one third may be subtracted from them.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Tuskar and St. David's Head.	The stream curves with the land and slacks in shore $1\frac{1}{2}$ hours before the offing, and inside the Long Bank $2\frac{1}{2}$ hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. $\frac{3}{4}$ E. S.W. $\frac{3}{4}$ W.	Rate. 3 3	N. E. by E. $\frac{1}{4}$ E. S. W. by W. $\frac{1}{4}$ W.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$	F E
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. $\frac{1}{2}$ N. S.W. by S.	3·6 3·6	N.E. $\frac{1}{4}$ N. S.W. $\frac{1}{2}$ S.	$3\frac{1}{2}$ $3\frac{1}{2}$	F E
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns $1\frac{1}{2}$ hours before the offing, and 2 hours close in shore.	Kish Light Ship.	N.N.E. S.S.W. $\frac{1}{4}$ W.	2·0 2	N.N.E. S.S.W. $\frac{1}{4}$ W.	$2\frac{1}{2}$ $2\frac{1}{2}$	F E

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs $2\frac{1}{2}$ knots at springs.
At 5 miles ditto ditto 3 to $3\frac{1}{2}$ knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. $\frac{1}{2}$ E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. $\frac{1}{2}$ N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. $\frac{3}{4}$ S. W.N.W. $\frac{1}{2}$ W.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$	E. $\frac{1}{4}$ N. W. $\frac{1}{4}$ S.	Rate. $1\frac{1}{2}$ $1\frac{1}{2}$	F E
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. by E. S. by W.	1·0 $1\frac{1}{4}$	N.E. $\frac{1}{4}$ E. S.S.W.	$\frac{1}{2}$ $\frac{1}{2}$	F E

of the TIDAL STREAMS in the IRISH CHANNEL.

of the Stream.					Remarks on the Tides near the Land.	Position.
	$\frac{1}{2}$ over.		5 Miles.	From		
F	N.E. $\frac{1}{2}$	Rate. $2\frac{1}{2}$	N.E. $\frac{1}{2}$ E.	Rate. $3\frac{1}{2}$ to 4	St. Davids Head.	On a line joining St. Davids Head and the Tuskar.
E	S.W. $\frac{1}{2}$ W.	$2\frac{1}{2}$	S.W. $\frac{1}{2}$ W.	4		
and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.						
F	N.E. by N.	$3\frac{1}{2}$	N.N.E. $\frac{1}{2}$ E.	3	Bardsey Island.	On a line joining Bardsey Island and the Arklow Light Ship.
E	S.W. $\frac{1}{2}$ S.	3	S.S.W. $\frac{1}{2}$ W.	$2\frac{1}{2}$		
Sound before it does in the offing; the flood setting strong into Caernarvon, and the ebb strong into Cardigan Bay, and <i>vice versa</i> .						
F	N.N.E. $\frac{1}{2}$ E.	$2\frac{1}{2}$	N. by E. $\frac{1}{2}$ E.	$3\frac{1}{2}$	Holyhead -	On a line joining Holyhead and Kish Light Ship.
E	S.W.	$2\frac{1}{2}$	S.W. $\frac{1}{2}$ S.	3		
more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.						

first quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N. W. and W. S. W. from the lighthouse, according to time of tide; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N. W. winds occasion the heaviest seas; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N. E. by E. $\frac{1}{2}$ E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

of the Stream.					Remarks on the Tides near the Land.	Position.
	$\frac{1}{2}$ over.		5 Miles.	From		
F	East	Rate. 2	E. $\frac{1}{2}$ N.	Rate. 3	Skerry Lighthouse.	On a line joining the Skerries and the Calf of Man.
E	W. by S.	$1\frac{1}{2}$	W. $\frac{1}{2}$ S.	3		
thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.						
F	E. $\frac{1}{2}$ N.	$1\frac{1}{2}$	S.E. by E.	2	Calf of Man	On a line joining the Calf of Man and Rockabill.
E	W. by S.	$1\frac{1}{2}$	N.N.W. $\frac{1}{2}$ W.	$1\frac{1}{2}$		
ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.						

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ N.	Rate. 3 $\frac{1}{2}$ 3 $\frac{1}{4}$	East West	Rate. 2 2	F E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs 2 knots at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of 3 $\frac{1}{2}$ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	s.w. by w. $\frac{1}{2}$ w. N.E. by E.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	S.W. $\frac{1}{2}$ W. N.E. $\frac{1}{2}$ N.	0 $\frac{1}{2}$ Drain	F E
On a line joining Peel and Mull of Gallo-way.	- - -	Peel -	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ N.	1 1 $\frac{1}{2}$	E. by S. W.N.W. $\frac{3}{4}$ W.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	F E

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	S.E. by E. $\frac{3}{4}$ E. W. by N.	Rate. 3 $\frac{1}{4}$ 3	E. $\frac{3}{4}$ S. W. by N.	Rate. 2 $\frac{3}{4}$ 3 $\frac{1}{2}$	F E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. $\frac{3}{4}$ E. N.N.W.	2 $\frac{1}{2}$ 1 $\frac{1}{2}$	S. $\frac{3}{4}$ E. N.W. by N.	2 $\frac{1}{2}$ 2	F

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. $\frac{1}{2}$ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining Copeland Island and Mull of Gal-loway.	- - -	Copeland Island.	S. $\frac{1}{2}$ E. N. $\frac{1}{2}$ W.	Rate. 2 2	S. by E. $\frac{1}{2}$ E. N. by W. $\frac{1}{2}$ W.	Rate. 2 2 $\frac{1}{2}$	F E

Magnetic Direction and Rate of the

After High Water at Liverpool.											
1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. $\frac{1}{2}$ E.		North		N. by W. $\frac{1}{4}$ W.		N.N.W. $\frac{3}{4}$ W.		N.W. $\frac{1}{2}$ N.		S.W. $\frac{1}{2}$ W.	

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

of the Stream.					Remarks on the Tides near the Land.	Position.
	1 over.	5 Miles.		From		
F S.E. by E. 1/4 E. E W.N.W.	Rate. 1 1/2	S.E. 1/4 S. N.W. 1/4 W.	Rate. 2 2	Walney Island.	The stream sets sharply round Walney Island into Morecambe Bay.	On a line joining Walney Island and the Calf of Man.
F S. 1/4 E. E Slack	0 1/2	S. 1/4 W. N. 3/4 W.	1 1/2 1 1/2	Peel	To the N.W. of Peel the stream divides; one part runs towards the Calf,	On a line joining Peel and St. Johns Point.
the other turns to the N.E., passes Contrary Head, so called from the set of the tides off it, and runs with an increasing rate along the land to Jurby, and thence to the Point of Ayr.						
E.S.E. 1/4 E. N.W. by W. 1/4 W.	2 1/2 2 1/2	E.S.E. 1/4 E. N.W. by W.	3 0 3 1/2	Mull of Galloway.	Off the Mull of Galloway the stream attains its greatest strength, and occasions a race off the head; but there is usually a slack very close	On a line joining Mull of Galloway and Peel (Isle of Man).
to the shore, of which steamers who are acquainted take advantage. Between the Mull and Burrow Head the stream bends to the northward, and finally takes the curve of the bay of Luce, setting sharply into the bay round the Mull, and out round Burrow Head.						

of the Stream.			Remarks on the Tides near the Land.	Position.
5 Miles.	From			
F East E W.N.W. 3/4 W.	Rate. 4 4	Burrow Head	- - - - -	On a line joining Burrow Head and Point of Ayr.
F S.E. by S. E N.W. 1/4 N.	1 1/2	St. Bees Head	Between King William Bank and St. Bees Head the stream is slack, but near St. Bees begins to run, one part passing up the Solway, the other going on towards Walney.	On a line joining St. Bees Head and Point of Ayr.

passes on to Maughold Head, where it meets with the tide from the southern channel. At half flood the stream at the Bahama runs towards Ramsay, and then turns to the north-west the rest of the tide.* A few miles westward of this spot, in latitude 54° 18' N. and longitude 4° W., the streams from the Calf of Man, and that which had passed over the Whitestone Bank, meet and thence run directly for Walney Island.

of the Stream.			Remarks on the Tides near the Land.	Position.
5 Miles.	From			
F S.S.E. 1/4 E. E N. by W. 1/4 W.	Rate. 3 3	Mull of Galloway.	- - - - -	On a line joining Mull of Galloway and Cope-land Island.

Stream at the Bahama Light Vessel.

Before High Water at Liverpool.

5 Hours.		4 Hours.		3 Hours.		2 Hours.		1 Hour.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
S. 1/4 W.		S. 1/4 W.		S.W.		N.W. 1/4 W.		N. by E. 1/4 E.	

* See Bahama Light Vessel.

TABLE showing the DIRECTION and RATE (at Springs)

Copeland Islands and Lough of Belfast.

The main body of the stream, ebb and flood, crosses the entrance of this Lough in a curve from the Copeland Islands to Blackhead, and near the islands gains a strength of 5 knots; this curve bends more and more in until it stretches from Whitehead to Grey Point, when it divides, one part of the flood running up to Garmoyle, the other bending back and running towards Orlock, and near that place will carry a vessel upon the Briggs if not guarded against.

The first of the flood sets through the Copeland Sound and between the islands at a rapid rate, and care must be taken not to be swept into the intricate passage between the Copeland Islands. At half tide all the inshore part of the tide within $1\frac{1}{2}$ miles of the coast south of the Copelands slacks, and shortly turns to the northward and runs for 3 hours, whilst the stream in the offing is still going to the southward; so that from Ballyferris Point to Foreland Point, quite close

The tides off Muck Island run from $3\frac{1}{2}$ to $4\frac{1}{2}$ knots close in, and occasion a race and heavy breaking sea at the springs; and in blowing weather there are races also off both Blackhead and Whitehead, and also the Gobbins; with the *ebb-tide* there is an eddy from half tide, close in with the shore, which may be taken advantage of by steamers at all times, and by sailing-vessels with a leading wind; but it does not extend sufficiently far off for sailing-vessels to benefit by it with a working wind, as they would be in danger of getting on the rocks if they missed stays.

Position.	Remarks on the Tides near the Land.	Magnetic Direction of the Stream.					
		From	} over.		} over.		
On a line joining Tor Point and Mull of Cantyre.	Close off Tor Point the flood runs upwards of four knots at springs.	Tor Point	S. by E.	Rate.	S. by E. $\frac{1}{2}$ E.	Rate.	
			N. by W.	$4\frac{3}{4}$	N. by W. $\frac{1}{2}$ W.	$4\frac{3}{4}$	F E

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

The 3rd quarter of the flood having turned to the northward, meets the tide through the Sound off the Deputy Reef, and they jointly strike off for the south end of the Copeland Islands and pass over the Bushes, and thence through the Channel between the Islands.

The eddy under Mew Island at this time rushes with great speed to the N.E. until it meets the true tide, and with it forms a race which sailing-vessels should avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

The last of the flood goes to the northward through the Sound, and splits off the south end of the Copeland, and one part runs for Mew Island, throwing off branches between the islands.

All about the Copeland Islands the eddies are very strong, and at night a vessel should be sure that she is outside the drift of the point of Mew Island.

of the Stream.			From	Remarks on the Tides near the Land.	Position.
	5 Miles.	Rate.			
F E	E.S.E. N.W. by W.	2 1 3/4	Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
F E	S. 1/4 E. N. 1/4 W.	1 1/4 1 1/2	Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.

After passing Whitehead, the tide slacks considerably as you enter the Lough. With the flood there is a strong eddy under Muck Island, which will be found very useful to steamers and even sailing-vessels beating along this coast; with a northerly wind they will do well to keep close in with the shore hereabout, as the strength of the flood strikes off from Muck Island in a S.E. direction, till it meets the stream which passes the eastern side of the Maidens, when it takes a channel direction; the meeting of these two tides appear to have occasioned a deep ditch, in which will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.	Position.
Near the Mull of Cantyre the stream runs 5 knots, and occasions a heavy dangerous sea in bad weather; with either tide, quite close in, there is an eddy. From the Mull of Cantyre the flood takes a direction nearly for Sanda Island, and divides off its western end: one part passing inside the island and up Kilbrennen Sound, the other running on for the Clyde.	On a line joining Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

BY RICHARD HOSKYN, STAFF COMMANDER R.N.,

Hydrographic Office, Admiralty,

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- Rate of tide.* ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{4}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.
- Eddy from Tor Point through the Sound.* On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.
- Eddy on south shore.* To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and true streams.
- Ebb stream.* During the first hour and half, the ebb stream sets round the Rue Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{4}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-more, which may be attended with danger to small vessels.
- Eddy in Church Bay.* The eddy from Church Bay has now forced the main stream into a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.
- Dangerous overfall.*
- Direction of ebb.*
- Flood stream.* The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, and rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the eastward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island; at the junction of the eddy and true streams there are great overfalls off Altacarry Head, and again off the Rue as mentioned above.
- Eddy to eastward of Island.*
- Navigation of Sound.* With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.
- Streams off Bengore Head.* Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

At the Skerry Islets the *ebb stream* sets fair through the anchorage and Sound to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in its passage between Ramore Head and the Carr Rocks, and creating a very troublesome sea. *Streams near the Skerry Islet.*

The flood stream sets from Ramore Head towards the Carr Rocks; when the Sound is entered it sets fair through.

In Broad Sound it sets down on the Little Skerry, while the ebb inclines to the northward through the Sound.

At the anchorage under the Great Skerry there is little tide felt, on the flood it is slack water at half tide, on the ebb with the last quarter, while on the north side of the rocks the stream runs with a velocity of 3 knots.

As we proceed to the westward towards Lough Foyle the tide loses much of its strength, north of the mouth of the Bann, 3 miles off shore its average rate at springs is $1\frac{3}{4}$ knots. *To the westward.*

There is an eddy tide all the way along the shore from the Skerry Islets to the mouth of the Bann, commencing at half tide, the line of its junction with the main stream being marked by a strong rippling. *Eddy.*

Two miles north of Port Stewart the channel stream turns to the eastward 1 hour and 40 minutes after low water at Liverpool, or at high water on the adjoining shore, and to the westward 31 minutes after high water at Liverpool, or three quarters of an hour before low water on the adjoining shore, so that, on this part of the coast, the tide wave (with reference to its head at Liverpool) being nearly reversed, we witness (what to a person watching the rise and fall of the tide on the shore appears at first sight so anomalous) the whole of the ebb stream coming from the ocean, while the flood comes from the opposite quarter. *Off Port Stewart.*

Referring the tidal stream to the head of the tide at Liverpool, and the varying times of high water to the undulation of the tide wave, this apparent anomaly disappears. *High and low water not occasioned by tidal stream, but by tidal wave.*

All this coast to the westward of Fair Head is subject to a ground swell, in fine weather the commencement of the east-going stream is made apparent by the sudden appearance of the swell, resuming again a comparative state of quiet when the west-going stream makes. *Ground swell.*

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH TABLES
SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE TIDE
AT DOVER.

*Streams turn
with the tides of
Dover.*

IN the English Channel, as before stated (page 120), the time of high water at *Dover* is to be taken as the standard, so that whenever either the time of the turn or the direction of the stream is required to be known, the time of the ship is to be compared with the time of high water for the day at the standard place, and the interval sought in the table which accompanies these remarks, and in the column answering to the ship's position will be found the information required.*

*Tidal Compart-
ments.*

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channels, for the courses of the stream in the mixed tides are so changeable that a very different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, whether N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

*1st Compart-
ment.*

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining Ushant and Scilly.*

*2d Compart-
ment.*

The 2d compartment comprises a space eastward of the before-mentioned line from Ushant to Scilly, and as far as a *line joining the Start and the Casquets.* In this part of the Channel there is a mixed tide, partaking of the joint directions of the Channel and Offing streams.

*3d Compart-
ment.*

The 3d compartment is bounded on the west by the line joining the Casquets and the Start, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets into the true Channel stream which sets straight up and down Channel in the fairway, and will always carry a vessel *towards Beachy Head* while the water is *rising at Dover*, and *from it* while it is *falling there.*

*4th Compart-
ment.*

The 4th compartment comprises the Gulf of St. Malo, an estuary which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity; and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets sharply *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across and out of* the Gulf, the north-eastern part of the stream sweeping round the Casquets towards Alderney, and through the Russel and other Channels about Guernsey towards the race of Alderney.

*5th Compart-
ment.*

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the flood tide the western half of the bay is partly in eddy, and the tide slacks in all that part nearly an hour before high water at Dover, whilst in the eastern half of the bay it runs about half an hour longer than at Dover,

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

so that here a ship beating up Channel towards the end of a rising tide at Dover may prolong the tide in her favour by standing close over to the French Coast eastward of Havre. On approaching Boulogne, however, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and are turned down upon the French Coast, so that a ship, which on the English side would at this time have a stream setting straight up Channel, here encounters one upon her beam, sweeping her down towards the Somme, and hence probably the cause of some of the many disastrous losses which have occurred in this part of the Channel.

6th Compartment.

The 6th compartment is between Beachy Head and the North Foreland, and the Somme and Dunkerque. In this space the streams from the Channel and North Sea *meet* while the water is *rising* at Dover, and *separate* while it is *falling* there. The point of union and separation is not, however, stationary, but moves from west to east both on the rising and falling water. For instance, an hour after high water at Dover the separation begins off Beachy Head; in two hours it has reached Hastings, in three hours Rye, and so it creeps on until at low water it has gained the line extending from the North Foreland to Dunkerque. At this time the offing streams on both sides have done, and it is slack water all over the North Sea and English Channel as far as the true tide extends; but the stream does not at this time cease in the intermediate tide. When the water at Dover begins to rise, the stream on either side sets *towards Dover*, and that from the North Sea consequently *goes with the intermediate* tide, which had not yet ceased running to the westward, while the other, the Channel stream, *opposes* it, and this opposition continues throughout the rising tide at Dover; the point of meeting gradually shifting its position eastward as the tide advances on the shore.* About the time when the water at Dover has done rising, the line of meeting has reached the North Foreland, and the streams are now slack over the Channels east and west, leaving the intermediate stream running alone as before to the eastward. The next hour finds the offing streams made down east and west, so that now the intermediate stream falls in with the North Sea stream and goes with it, whilst on the west it separates from the Channel stream, splitting at the same point, Beachy Head, as at first.

Such is the general description of the course and routine of the tidal streams of the English Channel and intermediate tide, a careful perusal of which will enable the reader the more readily to understand the directions and tables annexed.

* The place of *meeting* begins off Beachy Head at *five hours before* high water on the *same spot* as that of the *separation* at *one hour after* high water; the place of *four hours before* high water is nearly the same as that of the separation at *two hours after*; and so on nearly with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every Hour of the Tide at DOVER.

COMPARTMENT I.

Westward of a Line joining Ushant and the Land's End.

Hours.		North Side of Latitude 49'00 N.						REMARKS.	South Side of 49'00 N.	
		West part.	Rate.	Near Scilly.	Rate.	Seven Stones.	Rate.		West part.	Rate.
After High Water, Dover.	1	W.N.W. $\frac{1}{4}$ W.	Greatest rate, springs, 1'50 knots.	N.N.W. $\frac{1}{2}$ W.	Greatest rate, springs, 1'50 knots.	N. $\frac{1}{4}$ W.	Greatest rate, springs, 1'60 knots.		W. $\frac{1}{2}$ S.	Greatest rate, springs, 1'50 knots.
	2	N. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N.N.E.			N. by W. $\frac{1}{4}$ W.	
	3	N.E. $\frac{1}{4}$ E.		N.N.E.		N.E. $\frac{1}{4}$ N.			E.N.E. $\frac{1}{4}$ E.	
	4	E.N.E. $\frac{1}{4}$ E.		N.N.E.		N.E. $\frac{1}{2}$ E.			E.N.E. $\frac{1}{4}$ E.	
	5	E.N.E. $\frac{1}{4}$ E.		N.E. by E.		N.E. $\frac{1}{4}$ E.			N.E. by E. $\frac{3}{4}$ E.	
	6	E. $\frac{1}{4}$ S.		E. $\frac{1}{4}$ S.		E.N.E. $\frac{1}{4}$ E.			Turning.	
Before High Water, Dover.	5	S.E. by E. $\frac{1}{2}$ E.	Greatest rate, springs, 1'50 knots.	- - -	Greatest rate, springs, 1'50 knots.	S. $\frac{1}{4}$ W.	Greatest rate, springs, 1'60 knots.		S. by E. $\frac{1}{2}$ E.	Greatest rate, springs, 1'50 knots.
	4	S. $\frac{1}{2}$ E.		South.		S.S.W. $\frac{1}{4}$ W.			Draining.	
	3	S.S.W. $\frac{1}{4}$ W.		S.W.		S.S.W. $\frac{1}{2}$ W.			S.W. $\frac{1}{4}$ W.	
	2	S.W. by W.		S.W. by W.		S.W. $\frac{1}{2}$ S.			S.W. $\frac{1}{4}$ S.	
	1	W.S.W. $\frac{1}{4}$ W.		S.W. by W.		W.S.W.			S.W. by W. $\frac{1}{4}$ W.	

COMPARTMENT II.

Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Iles.

Hours.	North Side of the Channel.						REMARKS.	South Side of the Channel.						
	West part.	Rate.	Centre.	Rate.	East part.	Rate.		West part.	Rate.	Centre.	Rate.	East part.	Rate.	
After High Water, Dover.	1	W.N.W. $\frac{3}{4}$ W.	Greatest rate, springs, 2'00 knots.	W. $\frac{1}{4}$ N.	Greatest rate, springs, 1'50 knots.	W. $\frac{1}{2}$ N.	{ W. $\frac{1}{4}$ S. near Hurd's Deep. }	W. $\frac{1}{2}$ S.	Greatest rate, springs, 1'50 knots.	W. $\frac{3}{4}$ N.	Greatest rate, springs, 1'50 knots.	W. $\frac{1}{2}$ S.	Greatest rate, springs, 2'10 knots.	
	2	Turning.		N.W. by W. $\frac{3}{4}$ W.		W. $\frac{1}{4}$ N.		Slack.		West.		W. by S.		
	3	N. $\frac{1}{4}$ E.		W. $\frac{3}{4}$ N.		West.		East.		Slack.		W.S.W.		
	4	E. $\frac{1}{2}$ S.		Slack.		S. $\frac{1}{2}$ W.		E. by N.		E.S.E. $\frac{1}{4}$ E.		S.E. by S.		
	5	East.		E. $\frac{1}{2}$ S.		S.E. $\frac{1}{2}$ S.		E.N.E. $\frac{3}{4}$ E.		E. $\frac{1}{2}$ S.		S.E. by E. $\frac{3}{4}$ E.		
	6	E. by S.		E. $\frac{1}{2}$ S.		E.S.E. $\frac{1}{4}$ E.		E. $\frac{1}{4}$ N.		S.E. by E. $\frac{3}{4}$ E.		S.E. $\frac{1}{2}$ S.		
Before High Water, Dover.	5	E.S.E. $\frac{1}{2}$ E.	Greatest rate, springs, 2'00 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E. by S.		{ W. $\frac{1}{4}$ S. near Hurd's Deep. }	E. $\frac{1}{4}$ S.	Greatest rate, springs, 1'50 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E.S.E. $\frac{1}{2}$ E.	Greatest rate, springs, 2'10 knots.
	4	Slack.		E.S.E. $\frac{3}{4}$ E.		E. $\frac{3}{4}$ S.			N.E. by E. $\frac{3}{4}$ E.		Slack.		E. $\frac{1}{4}$ N.	
	3	Turning.		Slack.		E. $\frac{1}{2}$ S.			Slack.		W.N.W.		North.	
	2	W. by N.		W. $\frac{1}{4}$ N.		Turning.			S.W. by W. $\frac{1}{4}$ W.		Slack.		W.N.W. $\frac{3}{4}$ W.	
	1	W. $\frac{3}{4}$ S.		W. $\frac{1}{4}$ N.		W.S.W. $\frac{1}{4}$ W.			S.W. by W.		W. by N.		N.W. $\frac{1}{2}$ W.	

COMPARTMENT III.

Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.	Off Cape Barbeur.	Rate.
After High Water, Dover.	1 W. & N.	Greatest rate, } flood 2'30 } ebb 2'40 } knots.	W.N.W. & W.	Greatest rate, } flood 3'6 } ebb 3'3 } knots.	Turning.	Greatest rate, } flood 3'00 } ebb 2'40 } knots.	.	W. ¼ S.	Greatest rate, } flood 2'15 } ebb 2'40 } knots.	N.W.	Greatest rate, } flood 2'4 } ebb 2'2 } knots.
	2 W.N.W. ½ W.		N.W. by W. & W.		W.N.W. ½ W.			W. ¼ S.		N.W.	
	3 W. & N.		N.W. by W. & W.		W.N.W. & W.			W. & S.		N.W.	
	4 W. & S.		W.N.W.		W. & N.			W.S.W.		N.W.	
	5 W. & S.		W.N.W.		W. by N.			W.S.W. ¼ W.		N.W.	
	6 N.N.E. & E.		W.N.W. & W.		W. by N.			Slack.		N.W.	
Before High Water, Dover.	5 E. & S.	Greatest rate, } springs.	E.S.E.	Greatest rate, } springs.	E.S.E. & E.	Greatest rate, } springs.		E. ¼ S.	Greatest rate, } springs.	S.E.	Greatest rate, } springs.
	4 E.S.E. & E		S.E. by E. & E.		E.S.E. & E.			E. ¼ S.		S.E.	
	3 E.S.E. & E.		S.E. by E. & E.		E.S.E. & E.			E & S.		S.E.	
	2 E.S.E. & E.		S.E. by E. & E.		E.S.E. & E.			E. ¼ N.		S.E.	
	1 E.S.E. & E.		E.S.E.		E & S.			E.N.E.		S.E.	

COMPARTMENT IV.

Entrance of Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island.

Hours.	12 miles from Brehat Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
	Course.	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	N.W. by W.	Greatest rate, springs, uncertain knots.	W. ¼ N.	Greatest rate, springs, uncertain knots.		W. ¼ N.	Greatest rate, springs, uncertain knots.	W. ¼ S.	Greatest rate, springs, uncertain knots.	S.W. by W. ¼ W.	Greatest rate, springs, 5 to 7 knots.
	S. ½ W.		S. ¼ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
	S. ¾ W.		S. ¾ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
	S.E. ¼ S.		S.S.E. ¼ E.			S.E. by E. ½ E.		S. by E. ¼ E.		S.W. ¼ S.	
	S.E. ½ S.		S.E. ¼ E.			S.E. by E. ½ E.		S.E. ½ E.		S.W. ¼ S.	
	S.E. ¾ S.		S.E. ¼ S.			S.E. by E. ½ E.		S.E. ½ E.		N.E. by E. ¼ E.	
Before High Water, Dover.	S.E. ¼ E.	Greatest rate, springs, uncertain knots.	S.E. by E.	Greatest rate, springs, uncertain knots.		{ S.E. by E. ¼ E. E. ¼ N. S.E. by E. ¼ E. E. ½ N.	Greatest rate, springs, uncertain knots.	E. ¼ N.	Greatest rate, springs, uncertain knots.	N.E. by E. ¼ E.	Greatest rate, springs, 5 to 7 knots.
	..		..			{ S.E. by E. ¼ E. E. ½ N.		N.E. ½ N.		N.E. by E. ¼ E.
	N.W. by W.		N.W. ¼ N.			..		N.E. ½ N.		N.E. ¼ N.	
	N.W. by W.		N.W. ¼ W.			N. by W. ¼ W.		N.E. by E. ¼ E.		N.E. ¼ N.	
	N.W. ¾ W.		W.N.W. ¼ W.			N. by W. ¼ W.		N.W. ½ W.		N.E. ¼ N.	

COMPARTMENT V.

In the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

Hours.	West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
After High Water, Dover.	N.N.W. ¼ W.	4:20 } knots. ebb 3:50	N.W. by W. ¼ W.	5:20 } knots. ebb 3:20	W. ½ N.	3:30 } knots. ebb 3:00	
	N.N.W. ¼ W.		N.W. by W. ¼ W.		W. ¾ S.		
	N.N. W.		N.W. by W. ¼ W.		W.N.W. ¼ W.		
	N.N.W. ¼ W.		N.W. by W. ¼ W.		W. ¼ N.		
	N. by W. ¼ W.		N.W. by W. ¼ W.		W. ¼ N.		
	Slack.		N.W. by W. ¼ W.		W. ¼ S.		
Before High Water, Dover.	S.S.E.	Greatest rate, springs, -	S.E. by E. ¼ E.	Greatest rate, springs, -	W. ¼ S.	Greatest rate, springs, -	
	S.S.E.		S.E. by E. ¼ E.		E.N.E. ¼ E.		
	S.S.E.		S.E. by E. ¼ E.		E.N.E. ½ E.		
	S.E. by S.		S.E. by E. ¼ E.		E.N.E. ¾ E.		
	S.E. by S.		S.E. by E. ¼ E.		E.N.E. ¾ E.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and
 " the North Foreland and Dunkerque.

Hours.	REMARKS.	West of	East of	Off Southsand Head.		Off Northsand Head.	
		Line of Separation.		Course.	Rate.	Course.	Rate.
After High Water, Dover.	{ The Tides separate on a line joining— Beachy Head and St. Valery Hastings and Treport Hastings and Cayeux Folkstone and Calais South Foreland and Point Gravelines Ramsgate and Nieuport, passing over North Sand Head, the South Line of the Falls, and the banks off Nieuport }	W. by N.	N.E. by E. ¼ E.	N.E. ¼ E.	Greatest rate, springs, 3 3 knots.	N.N.E.	
		W. ¼ N.	N.E. by E. ¼ E.	N.E. ¾ E.		N.N.E.	
		W. ¼ N.	E.N.E.	N.E. by E. ¼ E.		N.E. ¼ E.	
		W. by S.	E.N.E.	N.E. by E. ¼ E.		E. by S.	
		s.w. by w. ¼ w.	N.E. by E. ¼ E.				
		W. by S.	{ E. ¼ N. and Northward.	S.W. ¼ S.		S.S.W.	
Before High Water, Dover.	{ The Tides meet on a line joining— Beachy Head and Point Ailly Bexhill and Cayeux, both streams turning down towards the "Somme" The Tides meet on a line joining Rye and the Somme, passing over the Bassurelle, both tides setting to the Somme The Tides meet on a line joining— Dungeness and Touquet Point Do. Dover and Dunkerque nearly }	Tides meet.			Greatest rate, springs, 3 3 knots.		
		E.S.E.	s.w. by w. ¼ w.	S.W.		S.S.W.	
		S.S.E. ¼ E.	S. by W. ¼ W.	S.W. ¾ W.		S.S.W.	
		S.E. by E. ¼ E.	S.W. by W.	W.S.W. ¼ W.		S.S.W.	
		E. by N.	W.S.W. ¼ W.	W. ¾ N.		S.S.W.	
		N.E. by E. ¼ E.	W.S.W.	N.N.E.		S.S.W.	

SECTION III.

'TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light and the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
True Stream.*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at that place*.* This stream sets nearly N.E. and S.W., except near the coasts, where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz., at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, and 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel of 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel of 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel of 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel of 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and the Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly 40 minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGO-LAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.
Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles north of North Foreland.		Galloper Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. by N.	Greatest rate, springs, 2'50 knots.	Slack.	Greatest rate, springs, 3'00 knots.	N.E.	Greatest rate, springs, 2'80 knots.	N.N.W. ½ W.	1'80	N.E. ½ E.	Greatest rate, springs, 2'5 knots.
	2 Slack.		N.E. by E. ¾ E.		N.E.		N. ½ E.	1'20	N.E. by E.	
	3 E. ¾ S.		E.N.E. ¾ E.		N.E.		N.E. ½ E.	1'18	N.E. by E.	
	4 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'46	N.E. ¾ E.	
	5 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'60	N.E. by E.	
	6 E. ½ S.		E.N.E. ¾ E.		N.E.		S.E. ¾ E.	1'45	N.E. by E.	
Before High Water, Dover.	5 E. ¾ S.	Greatest rate, springs, 2'50 knots.	..	Greatest rate, springs, 3'00 knots.	S.W. ¾ S.	Greatest rate, springs, 2'80 knots.	S.S.E. ½ E.	1'30	S. ¾ W.	Greatest rate, springs, 2'5 knots.
	4 Slack.		S.W. by W. ¾ W.		S.W. ¾ S.		S. ¾ W.	1'36	S.W. ¾ S.	
	3 W. ¾ S.		S.W. by W. ¾ W.		S.W. ¾ S.		S.W. ½ S.	1'60	S.W. by W.	
	2 W. ¾ S.		W.S.W. ¾ W.		S.W. ¾ S.		S.W. ½ W.	1'65	S.W. by W. ¾ W.	
	1 W. ¾ S.		W. ½ S.		S.W. ¾ S.		W.S.W.	1'40	W.S.W.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hours.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 N.E. ¾ E.	Greatest rate, springs, {flood 2'50 to 2'55 } knots. ebb 2'50 to 2'55 }	E.N.E. ¾ E.	Greatest rate, springs, {flood 2'50 to 3'0 } kts. ebb 2'00 to 3'0 }	N.E. by E. ¾ E.	Greatest rate, springs, 2'50 to 2'90 knots.	Stream from the Schelde N.W. by W. to 3° E. turning sharply to N.E. Stream from the Schelde N.W. by W. to 2'30 E. turning sharply to N.N.E. ½ E.
	2 N.E. ½ E.		E.N.E.		N.E. by E.		
	3 N.E.		N.E.		N.E. ½ E.		
	4 N.E. by E. ¾ E.		N.E. ¾ E.		N.E. ½ E.		
	5 N.E. ½ E.		N.E. ½ E.		N.E. ½ E.		
	6 N.E. ¾ E.		N.E.		N.N.E. ¾ E.		
Before High Water, Dover.	5 S.W. ¾ S.	Greatest rate, springs, 2'50 to 2'55 knots.	S.W. by W. ¾ W.	Greatest rate, springs, 2'50 to 3'0 kts.	W.S.W.	Greatest rate, springs, 2'50 to 2'90 knots.	
	4 S.W.		S.W. ½ W.		S.W. ¾ W.		
	3 S.W.		S.W.		S.W. ¾ W.		
	2 S.W.		S.W.		S.W. ½ W.		
	1 S.W. ¾ S.		S.W.		S.W. ¾ W.		

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.	REMARKS.	
After High Water, Dover.	Stream runs northward.	
Before High Water, Dover.	Stream runs southward.	

Taking the direction of the land, except close to the banks, for which special instructions are necessary.

TIDAL STREAMS

COMPARTMENT IX.—continued

Hours.	Shipwash Light Vessel.		Stanford Light Vessel.		St. Nicholas Gat Light Vessel.		Cockle Light Vessel.		Newarp Light Vessel.		Hasbrough Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1	E.N.E. $\frac{1}{4}$ E.	N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	2	E.N.E. $\frac{1}{4}$ E.	N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	3	E.N.E. $\frac{1}{4}$ E.	N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	4	E.N.E. $\frac{1}{4}$ E.	N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ W.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	5	N.E. by E. $\frac{1}{4}$ E.	N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	6	N.E.	Slack		N. by W.		S. $\frac{1}{4}$ W. on the turn.		N. $\frac{1}{4}$ E.		S. by E.	
Before High Water, Dover.	5	S.W. $\frac{1}{4}$ W.	S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.	
	4	S.W. by W. $\frac{1}{4}$ W.	S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.	
	3	S.W. by W. $\frac{1}{4}$ W.	S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.	
	2	S.W. by W. $\frac{1}{4}$ W.	S.W. by S.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S.S.E.	
	1	S.W. by W. $\frac{1}{4}$ W.	S.S.W. $\frac{1}{4}$ W.		S. by W. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S by E.	

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1	N.E. $\frac{1}{4}$ N.	N.E.		N.E. $\frac{1}{4}$ N. *		N. by W.		* Turning sharply off for the Leman and Ower.
	2	N.E. $\frac{1}{4}$ N.	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		
	3	N.E. $\frac{1}{4}$ N.	N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		
	4	N.E.	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		
	5	N.E. $\frac{1}{4}$ N.	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ W.		
	6	N.E. $\frac{1}{4}$ N.	N.E. $\frac{1}{4}$ N.		N.E. by N.		N.N.E. $\frac{1}{4}$ E.		
Before High Water, Dover.	5	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ W.		Greatest rate, springs, { flood 1'40 } ebb 1'40 } knots.
	4	S.W.	S.W. $\frac{1}{4}$ S.		South.		S. $\frac{1}{4}$ W.		
	3	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		S. by W.		
	2	S.W.	S.W. $\frac{1}{4}$ S.		S.S.W. $\frac{1}{4}$ W.		S.S.W.		
	1	S.W. $\frac{1}{4}$ W.	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1	N.E.	Slack.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		Stream setting round Texel south-western.
	2	N.E.	N.E.		N.E.		N.E. $\frac{1}{4}$ N.		
	3	N.E.	N.E.		N.E.		N.E.		
	4	N.E. $\frac{1}{4}$ N.	N.E.		N.E. $\frac{1}{4}$ E.		N.E.		
	5	N.E. $\frac{1}{4}$ N.	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
	6	N.E. $\frac{1}{4}$ N.	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
Before High Water, Dover.	5	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ S.		S. by E. $\frac{1}{4}$ E.		S.S.E. $\frac{1}{4}$ E.		Greatest rate, springs, { flood 1'70 } ebb 2'00 } knots.
	4	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ S.		S.S.W.		South.		
	3	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		
	2	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		
	1	S.W. $\frac{1}{4}$ S.	S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		

COMPARTMENT XII.

Between the latitude 52° and 53° N. and from longitude 4° E. to the Coast of the Netherlands.

Hours.		REMARKS.	
After High Water, Dover.	1	Stream runs northward.	The stream takes the direction of the land, except close to the banks, for which special instructions are necessary.
	2		
	3		
	4		
	5		
	6		
Before High Water, Dover.	3	Stream runs southward.	
	4		
	5		
	6		
	7		
	8		

COMPARTMENT XIII.

Between the latitude 53° and 54° N. and from longitude 1° to 3° E.

Hour.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	N.W. Quarter.	Leman and Ower Light Vessel.		REMARKS.
							Course.	Rate.	
1	N.N.W. ½ W.	Greatest rate, springs, { flood 2'25 } ebb 2'25 }	N. by W. ½ W.	Greatest rate, springs, { flood 2'00 } ebb 2'30 }	N.N.W. ¼ W.	N. ½ W.	N. by W. ¾ W.	Greatest rate, springs, 2'0 knots.	Near the north point of Smith's Knoll the rates are, flood 2'6, ebb 3'0 knots.
2	N.W. ½ N.		N. by W. ¼ W.		North.	N. ¾ W.	N. by W. ¾ W.		
3	N.N.W. ½ W.		N. ¾ E.		N. by E.	N. by W. ½ W.	N.N.W.		
4	N.N.W. ¼ W.		N. ¾ E.		N.N.E.	N.W. ½ W.	N.N.W.		
5	N.N.W. ¾ W.		N. ¾ E.		E.N.E.	S. by W. ¼ W.	N.N.W.		
6	- - -		N.N.E. ¼ E.		S.E.	S. ¾ E.	Slack.		
7	S.S.E. ¾ E.	Greatest rate, springs, -	S.S.E. ¾ E.	Greatest rate, springs, -	S.E. ½ S.	S. ½ E.	S.S.E.		
8	S.S.E. ¾ E.		S.S.E. ¾ E.		S. ¾ E.	S. by E. ¼ E.	S.S.E.		
9	S.S.E. ¼ E.		S. by E.		South.	S.S.E. ¼ E.	S.S.E.		
10	S. by E.		S. ¾ E.		S. ¾ W.	E.S.E. ½ E.	S.S.E.		
11	S.S.E. ½ E.		S. by W.		South.	N.E. by N.	S.S.E.		
12	- - -		- - -		- - -	- - -	- - -		

COMPARTMENT XIV.

Between the latitude 53° and 54° N. and 3° to 5° E. longitude.

	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
1	W.N.W. ½ W.	Greatest rate, } flood 1'20 } spring, - } ebb 1'50 }	W.S.W. ½ W.	Greatest rate, } flood 1'35 } spring, - } ebb 2'00 }	W. ¾ S.	Greatest rate, } flood 0'80 } spring, - } ebb 1'00 }	S.W. by W.	In the north-eastern quarter of this compartment the Helgoland stream joins the Channel stream on the falling water at Dover, and the streams split on the rising water at Dover, and a vessel to the northward of 53'30 on the rising tide will be set down towards Helgoland.	
2	N.N.W. ½ W.		W.S.W. ¼ W.		West.		N.W. by W. ¼ W.		
3	N. by W. ¾ W.		W. ¾ S.		West.		N.W. ½ N.		
4	N. by E. ¾ E.		N.N.W.		N.N.W. ½ W.		N. by W. ½ W.		
5	N.E. ½ N.		N.E. ¼ N.		N.E. ½ N.		N.E. by N.		
6	N.N.E. ¾ E.		N.E. by E. ¼ E.		E. ¾ N.		E. by N.		
7	E. ¾ S.	Greatest rate, } flood - } spring, - } ebb - }	E.N.E. ¾ E.	Greatest rate, } flood - } spring, - } ebb - }	E. by S.	Greatest rate, } flood - } spring, - } ebb - }	S.E. by E.	Splitting on Texel Island.	
8	S.E. ¾ S.		E.N.E. ¼ E.		E.S.E. ¾ E.		S.E. ½ E.		
9	S. by E.		S.S.W. ¼ W.		S.E. ¾ E.		South.		
10	S. by W. ¾ W.		S.W. by S.		S.E. ¾ S.		S.W. ¾ S.		
11	S.W. ½ S.		S.W. ¼ S.		S. ¾ E.		S.W. ½ S.		
12									

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. $\frac{1}{2}$ E.	Greatest rate, } flood $2\frac{1}{2}$ knots. } ebb $3\frac{1}{2}$ knots.	E.N.E.	Greatest rate, springs, $3\frac{1}{2}$ knots.	N. by W. $\frac{1}{2}$ W.	Greatest rate, springs, $2\frac{1}{2}$ knots.
	2 N.N.W. $\frac{1}{4}$ W.		S.W. by S.		N.N.W.	
	3 -		S.W. $\frac{1}{2}$ S.		N.W. $\frac{1}{4}$ N.	
	4 S.W.		S.W.		W. $\frac{1}{4}$ S.	
	5 S.W. $\frac{1}{2}$ W.		S.W.		S.W. $\frac{1}{4}$ S.	
	6 S.W. $\frac{3}{4}$ S.		S.W.		S. $\frac{1}{4}$ E.	
Before High Water, Dover.	5 S. $\frac{1}{2}$ E.	Greatest rate, } flood $2\frac{1}{2}$ knots. } ebb $3\frac{1}{2}$ knots.	S.W.	Greatest rate, springs, $3\frac{1}{2}$ knots.	S. by E. $\frac{1}{4}$ E.	Greatest rate, springs, $2\frac{1}{2}$ knots.
	4 S. by E. $\frac{1}{4}$ E.		N.E. by E.		S.S.E.	
	3 S.S.W. $\frac{1}{4}$ W.		N.E. by E. $\frac{1}{2}$ E.		S.E.	
	2 N. by E. $\frac{1}{4}$ E.		E.N.E.		E. $\frac{1}{2}$ S.	
	1 N.N.E. $\frac{1}{4}$ E.		E.N.E.		N.E. $\frac{1}{2}$ N.	

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by W. $\frac{1}{2}$ W.	Greatest rate, 1 knot.	N.N.W. $\frac{1}{2}$ W.	Greatest rate, 1 knot.	N.W. $\frac{1}{4}$ W.	Greatest rate, 1 knot.	N.W. by W. $\frac{1}{4}$ W.	Greatest rate, 1 knot.
	2 N. by W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ N.		N.W. by W. $\frac{1}{4}$ W.		W.N.W. $\frac{1}{4}$ W.	
	3 N.W. by N.		N.W. $\frac{1}{4}$ W.		N.W. by W. $\frac{1}{4}$ W.		W. by N.	
	4 S. $\frac{1}{2}$ E.		W.N.W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ W.	
	5 S. $\frac{1}{2}$ E.		W. $\frac{1}{2}$ S.		N. by W.		N.E. $\frac{1}{4}$ N.	
	6 S.S.E.		S. by E.		E. by N.		E. by N.	
Before High Water, Dover.	5 S.E. $\frac{1}{2}$ S.	Greatest rate, 1 knot.	S.E. $\frac{1}{4}$ S.	Greatest rate, 1 knot.	E.S.E. $\frac{1}{4}$ E.	Greatest rate, 1 knot.	E. $\frac{1}{4}$ N.	Greatest rate, 1 knot.
	4 S.E. by E.		S.E. $\frac{1}{4}$ E.		E.S.E. $\frac{1}{4}$ E.		E. $\frac{1}{2}$ S.	
	3 E. $\frac{1}{4}$ S.		S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{4}$ E.		E. by S.	
	2 N.E. $\frac{1}{4}$ N.		S.E. by E. $\frac{1}{4}$ E.		E.S.E.		S.E.	
	1 N. by E. $\frac{1}{4}$ E.		E.N.E. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ W.		S. by E. $\frac{1}{2}$ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W. $\frac{1}{4}$ W.	Greatest rate, 1 knot.	W. by N.	Greatest rate, 1 knot.	West	Greatest rate, 1 knot.	E.N.E. $\frac{1}{4}$ E.	Greatest rate, 1 knot.
	2 N.W. by W.		W.N.W.		W.N.W.		N.E. $\frac{1}{2}$ E.	
	3 W.N.W.		W.N.W.		W.N.W.		N.W.	
	4 W.N.W.		W. by N.		W.N.W.		W.N.W.	
	5 W.N.W.		W.N.W.		W.N.W.		N.W. by W.	
	6 W.N.W.		W.N.W.		W.N.W. $\frac{1}{4}$ W.		W. $\frac{1}{2}$ S.	
Before High Water, Dover.	5 E.S.E. $\frac{1}{2}$ E.	Greatest rate, 1 knot.	S.E. by E. $\frac{1}{2}$ E.	Greatest rate, 1 knot.	S.S.E. $\frac{1}{2}$ E.	Greatest rate, 1 knot.	W. by S.	Greatest rate, 1 knot.
	4 S.E. by E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.S.W. $\frac{1}{4}$ W.	
	3 S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ E.	
	2 S.E. $\frac{1}{4}$ E.		E.S.E. $\frac{1}{4}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.E. by E.	
	1 S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{4}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.N.E. $\frac{1}{4}$ E.	

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

COMPARTMENT XVII.

On the parallel of 55° N.

Hours.	0° E.		1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.W.	½	Slack.		N.N.E.		W. ½ S.		N.W. ½ N.	
	2 S. by W. ½ W.	½	S.W. ½ W.		W.S.W.		W. ½ N.		N.W. ½ W.	
	3 S. by E.	1 ½	S.S.W. ½ W.		N.S.W. ½ W.		W. ½ N.		N.W.	
	4 S. ½ E.	1	S. by W. ½ W.		S.W. by W.		N.W. by W.		N.W. ½ W.	
	5 S. ¾ E.	¾	S. by W. ¾ W.		S. ½ E.		S.W. by W. ¾ W.		West.	
	6 S. ¾ E.	¾	S. ¾ W.		S. by E. ¾ E.		S. by E.		S.S.E. ¾ E.	
Before High Water, Dover.	5 S.E. ½ S.	½	S. ½ E.		E.S.E. ½ E.		S. ½ E.		S.E. by E. ½ E.	
	4 N.N.E. ¾ E.	¾	E.N.E. ¾ E.		E. ½ S.		S.E. by E.		S.E. by E. ¾ E.	
	3 N. ½ W.	1 ½	N. by E. ½ E.		E. by N.		E. by S.		E. ¾ S.	
	2 N. ¾ W.	1	N.N.E.		E. ¾ N.		E. by S.		E. ¾ N.	
	1 N. ¾ W.	¾	N. by E. ¾ E.		N.E. by E.		N.E. by N.		N. by E. ¾ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W.		W. ½ N.		W.N.W. ½ W.		N. by W. ½ W.	
	2 W.N.W. ½ W.		W.N.W.		W.N.W. ½ W.		N. by W. ½ W.	
	3 W.N.W. ¾ W.		N.W. by W. ¾ W.		N.W. by W. ¾ W.		N.W. ¾ N.	
	4 N.W. by W. ¾ W.		W.N.W. ¾ W.		W.N.W. ¾ W.		N.N.W. ¾ W.	
	5 W. ¾ N.		W.N.W. ¾ W.		W. by N.		N.W.	
	6 Turning.		N.W. by W. ¾ W.		W. ½ S.		N.W. by W. ¾ W.	
Before High Water, Dover.	5 E. ¾ S.		S.E. ¾ S.		S.W. ½ W.		W. ½ S.	
	4 E.S.E. ¾ E.		S.E. by S.		S. ½ E.		S. by W. ¾ W.	
	3 E.S.E. ¾ E.		S.S.E. ¾ E.		S.S.E. ¾ E.		S. ¾ W.	
	2 E.S.E. ¾ E.		S.S.E. ¾ E.		S.E. by S.		S. ¾ E.	
	1 E. ¾ S.		S.S.E. ¾ E.		S.E. by S.		S. by E. ¾ E.	

COMPARTMENT XVIII.

On the parallel of 56° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.E. ¾ E.		Slack.		N.W. ¾ W.		N. ¾ E.	
	2 Slack.		S.W. ¾ W.		W.N.W.		N.N.W. ¾ W.	
	3 S. ¾ W.		S.W. ¾ W.		N.W. ¾ N.		N.W. ¾ W.	
	4 S. ¾ E.		W. by S.		N.W.		N.E. ¾ E.	
	5 S. ¾ E.		S. ¾ E.		N. by W. ¾ W.		N.E. by E. ¾ E.	
	6 S. ¾ E.		S. ¾ E.		N. ¾ W.		E. ¾ S.	
Before High Water, Dover.	5 S.E. by E. ¾ E.		E. by S.		N. by E. ¾ E.		E. ¾ N.	
	4 N.E. by E. ¾ E.		E.N.E. ¾ E.		N.E. ¾ E.		E. ¾ N.	
	3 N.E. ¾ N.		E.N.E.		East.		N.E. by E. ¾ E.	
	2 N.E. by N.		N.E. by E. ¾ E.		N.E. by E.		E.N.E. ¾ E.	
	1 N.E. ¾ E.		N.E. by E.		North.		N.E. by E. ¾ E.	

COMPARTMENT XVIII—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 Turning.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2 W. $\frac{1}{2}$ S.		2 N.N.W.		2 N.E. by N.		2 N. $\frac{1}{2}$ E.	
	3 N.W. $\frac{1}{2}$ N.		3 N.N.W.		3 N. $\frac{1}{2}$ E.		3 N. $\frac{1}{2}$ W.	
	4 N. by W. $\frac{1}{2}$ W.		4 N. by W. $\frac{1}{2}$ W.		4 N. $\frac{1}{2}$ W.		4 N. by W.	
	5 N.N.E. $\frac{1}{2}$ E.		5 N. $\frac{1}{2}$ W.		5 N. $\frac{1}{2}$ W.		5 N. by W.	
	6 N.E. $\frac{1}{2}$ E.		6 N.N.E.		6 N. by W.		6 N. by W.	
Before High Water, Dover.	1 E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 N.E. by E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 N. by W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 N.N.W. $\frac{1}{2}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2 N.E. by E. $\frac{1}{2}$ E.		2 E.N.E. $\frac{1}{2}$ E.		2 N.E. $\frac{1}{2}$ E.		2 N. by E.	
	3 E.N.E. $\frac{1}{2}$ E.		3 E. $\frac{1}{2}$ N.		3 E. $\frac{1}{2}$ S.		3 S. by W.	
	4 East.		4 E. $\frac{1}{2}$ S.		4 E. $\frac{1}{2}$ S.		4 S.W.S.	
	5 E. $\frac{1}{2}$ N.		5 E. by S.		5 S.E. $\frac{1}{2}$ E.		5 S.W. $\frac{1}{2}$ W.	
	6		6		6		6	

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S. W. by S.	Greatest rate $1\frac{1}{2}$ knots at half tide.	1 S. by W. $\frac{1}{2}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	1 S. by W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S. W. by S.		2 S.W. $\frac{1}{2}$ S.		2 S.S.W.	
	3 S. W. $\frac{1}{2}$ W.		3 S.W.		3 S. by W.	
	4 N. $\frac{1}{2}$ W.		4 W.S.W. $\frac{1}{2}$ W.		4 S. by W.	
	5 Slack.		5 Slack.		5 S. $\frac{1}{2}$ E.	
	6 N.N.E. $\frac{1}{2}$ E.		6 N. by E. $\frac{1}{2}$ E.		6 Slack.	
Before High Water, Dover.	1 N.E. $\frac{1}{2}$ N.	Greatest rate $1\frac{1}{2}$ knots at half tide.	1 N.N.E.	Greatest rate $1\frac{1}{2}$ knots at half tide.	1 N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 N.E.		2 N.N.E.		2 N. by E.	
	3 N.E. by N.		3 N.N.E. $\frac{1}{2}$ E.		3 N. by E. $\frac{1}{2}$ E.	
	4 N.E. by N.		4 N.E. $\frac{1}{2}$ N.		4 N.N.E. $\frac{1}{2}$ E.	
	5 South.		5 E.N.E.		5 N. by E. $\frac{1}{2}$ E.	
	6		6		6	

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 N. by E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S.S.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.W. $\frac{1}{2}$ S.		2 S. $\frac{1}{2}$ E.		2 South.		2 N.W. by W. $\frac{1}{2}$ W.	
	3 S.S.W. $\frac{1}{2}$ W.		3 S. by E.		3 S. by W. $\frac{1}{2}$ W.		3 W.N.W.	
	4 S.W. $\frac{1}{2}$ S.		4 S.E. by S.		4 S.W. by W. $\frac{1}{2}$ W.		4 N. by W. $\frac{1}{2}$ W.	
	5 Slack.		5 E. by S.		5 Slack.		5 N. by W.	
	6 N.E. $\frac{1}{2}$ E.		6 E. $\frac{1}{2}$ N.		6 Slack.		6 N. by E.	
Before High Water, Dover.	1 N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 E. $\frac{1}{2}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 Turning.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 N. E. by E.		2 E. by N.		2 N.E. by N.		2 N.E. $\frac{1}{2}$ N.	
	3 E.N.E. $\frac{1}{2}$ E.		3 East.		3 N.E. $\frac{1}{2}$ E.		3 N.E. by E. $\frac{1}{2}$ E.	
	4 E.N.E. $\frac{1}{2}$ E.		4 East.		4 E. by N.		4 E.N.E.	
	5 Slack.		5 S. $\frac{1}{2}$ E.		5 S.E. by E. $\frac{1}{2}$ E.		5 E. $\frac{1}{2}$ S.	
	6		6		6		6	

COMPARTMENT XIX.—*continued.*

Hours.	5°		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S. by E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 E.N.E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S.S.E.	Rate 0.9 knot.
	2 N.E. by N.		2 South.		2 E.N.E. $\frac{1}{4}$ E.		2 Slack.	
	3 S.W.		3 S. by W.		3 E.N.E.		3 N.E. by N.	
	4 N.N.W.		4 N.N.E.		4 E.N.E.		4 N.E. $\frac{1}{4}$ N.	
	5 N. $\frac{1}{4}$ W.		5 North.		5 E.N.E.		5 North.	
	6 N. by E. $\frac{1}{4}$ E.		6 North.		6 N.N.E.		6 N. by E.	
Before High Water, Dover.	3 N.E.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 N. by E.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 N.E. $\frac{1}{4}$ E.	Rate 0.9 knot.
	4 N.E.		4 N.N.E. $\frac{1}{4}$ E.		4 N.E. by N.		4 N.N.E. $\frac{1}{4}$ E.	
	3 N.E. $\frac{1}{4}$ E.		3 N.E. $\frac{1}{4}$ E.		3 N.E.		3 N.E. by E. $\frac{1}{4}$ E.	
	2 E. $\frac{1}{4}$ N.		2 E. by N.		2 N.E.		2 N.E. by E. $\frac{1}{4}$ E.	
	1 East.		1 E. by N.		1 N.E.		1 E.N.E. $\frac{1}{4}$ E.	

COMPARTMENT XX.

On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 South.	Greatest rate 1 knot about half tide.	1 S.E.	Greatest rate 0.6 knot about half tide.	1 S.S.W.	Greatest rate 1 knot about half tide.		
	2 S.E. $\frac{1}{4}$ S.		2 S.E.		2 S.S.W.			
	3 East.		3 S. $\frac{1}{4}$ E.		3 S.S.W.			
	4 E. by S.		4 S.E. $\frac{1}{4}$ S.		4 Slack.			
	5 Slack.		5 Slack.		5 N.N.W. $\frac{1}{4}$ W.			
	6 S.W.		6 N. by W.		6 N.N.E.			
Before High Water, Dover.	3 W. $\frac{1}{4}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 N.W. $\frac{1}{4}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 N.N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.		
	4 W.N.W. $\frac{1}{4}$ W.		4 N.W.		4 N.E.			
	3 N.W. by W. $\frac{1}{4}$ W.		3 N.W. by N.		3 N.E. $\frac{1}{4}$ E.			
	2 W. by N.		2 W. $\frac{1}{4}$ N.		2 S.S.E. $\frac{1}{4}$ E.			
	1 W. $\frac{1}{4}$ N.		1 S. $\frac{1}{4}$ E.		1 S.S.E. $\frac{1}{4}$ E.			

Hours.	1° E.		2° E.		3° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S.W.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S. by E.	
	2 West.		2 W.S.W.		2 S. $\frac{1}{4}$ E.	
	3 Slack.		3 W.N.W. $\frac{1}{4}$ W.		3 S. $\frac{1}{4}$ W.	
	4 Slack.		4 N.W. $\frac{1}{4}$ N.		4 S.S.W.	
	5 N.N.E.		5 N. $\frac{1}{4}$ E.		5 S. $\frac{1}{4}$ W.	
	6 N.N.E.		6 N. by E.		6 E. by N.	
Before High Water, Dover.	3 N.N.E.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 N. by E.	Greatest rate $\frac{1}{2}$ knot about half tide.	3 E.N.E.	
	4 N.N.E.		4 N. by E. $\frac{1}{4}$ E.		4 E.N.E.	
	3 N. by E. $\frac{1}{4}$ E.		3 N. by E.		3 E. by N.	
	2 Turning.		2 N.E. $\frac{1}{4}$ E.		2 E.S.E. $\frac{1}{4}$ E.	
	1 W. by N. $\frac{1}{4}$ N.		1 S.E.		1 S.E. by E.	

TIDAL STREAMS.

COMPARTMENT XXI.

On the parallel of 59° N.

Hours.	2° W.		1°		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. by S.	Greatest rate 1 knot about half tide.	S.S.W. ½ W.	Greatest rate 0·6 knot about half tide.	W.S.W.	Greatest rate ¾ knot about half tide.
	2 S. by W. ¾ W.		S.W. by S.		W.S.W. ¾ W.	
	3 S. ¾ W.		S.W. by S.		N. by E. ½ E.	
	4 S.W. by W. ½ W.		Slack.		N.E.	
	5 W. by N.		Slack.		N.E. ¼ E.	
	6 N.W. ½ W.		N. ¾ E.		N.E. by E.	
Before High Water, Dover.	5 N.N.W. ¾ W.	Greatest rate 1 knot about half tide.	N.N.W.	Greatest rate 0·6 knot about half tide.	N.E. by E.	Greatest rate ¾ knot about half tide.
	4 N.W. ¼ N.		N.N.W.		E. by N.	
	3 W.N.W.		N.W. by N.		S.E. ¼ E.	
	2 S.W. by W. ½ W.		S.W. by W. ¾ W.		S.S.W. ½ W.	
	1 S.W. ¼ W.		S.W. ¾ S.		W.S.W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS;
WITH THE RISE OF THE TIDE.
AT SPRINGS AND NEAPS.

AUTHORITIES.

Admiralty Charts. Alldridge, Barnett, Bate, Bayfield, Beaufort, Becher, E. J. Bedford, G. A. Bedford, F. W. Beechey, R. B. Beechey, Belcher, Biddlecombe, Blackwood, Boteler, Brooker, Bullock, Burdwood, Calver, Church, Collinson, Cox, Dayman, Denham, Drury, Edye, Evans, Fitz-Boy, Flinders, Frazer, Hewett, Hoskyn, Hull, Hutchison, Jeffery, Kellett, King, Lawrance, Lord, Mackenzie, Mooney, M'Dougall, Mudge, Orlebar, Otter, Owen, Parry, Raper, Reed, G. H. Richards, J. Richards, Robinson, Roe, Ross, Sheringham, Shortland, Skead, Slater, Spence, Stanley, Stanton, Stokes, Sullivan, Thomas, Vidal, Ward, Washington, White, Wickham, Williams, Wolfe, Wood, and Yule, of the Royal Navy; and Blair, Constable, Haines, Horsburgh, Moresby, Robinson, Ross, Stiffe, Wales, and Ward, of the Indian Navy. Maclear, H.M. Astronomer at the Cape of Good Hope.

Pilote Français. Beantemps-Beaupré, Bégat, Bougainville, Chazallon, D'Entrecasteaux, D'Urville, Duperrey, Givry, La Pérouse, and Roussin of the French Navy.

Bellingshausen, Krusenstern, Lisiansky, and Lütke of the Russian Navy.

Tasman, Melville, Smits, Swart, and Van Rhyn of the Dutch Navy.

Klint, Löwenorn, and Zahrtmann of the Danish and Swedish Navies.

Banza, Malaspina, and Tofiño of the Spanish Navy.

U. S. Coast Survey under Professor A. D. Bache. Maury and Wilkes of the U. S. Navy.

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

TIME

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PRINCIPAL PLACES ON THE GLOBE ;

ARRANGED ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE ;

*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>England, South Coast.</i>							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Scilly Is. (St. Agnes)	4 30	16	12	Teignmouth - -	6 0	13	9½
— (St. Mary)	4 18	15½	11½	Torbay - -	6 0	13½	10
— (Trescow)	4 22	16½	12½	Exmouth - -	6 21	12½	8½
Penzance - -	4 30	16½	12½	Lyme Regis - -	6 21	11½	8½
Lizard (Perran } Vose Cove) - }	5 0	14½	10½	Bridport - -	6 5	11½	7½
Coverack - -	4 35	14½	11½	Chesilton - -	6 13	10½	7
Helford (entrance)	4 43	15½	11½	Portland Breakwater	7 1	6½	4½
Falmouth - -	4 57	16	12	Poole - - {	9 10	6½	4½
— Truro }					12 45		
(Town Quay) - }	5 5	10	6	Christchurch - {	9 0	5	
Mevagizey - -	5 4	15½	12		11 30		
Fowey - -	5 14	15	11½	Needles Point - -	9 46	7½	5
East Looe - -	5 26	16	13	Hurst, Camber - {	10 0	7½	6
Plymouth Breakwater	5 37	15½	11½		12 0		
— Sutton }				Yarmouth - - {	10 0	7	6½
Pool - - }	5 32	15½	11½		12 0		
Devonport Dk. Yard	5 43	15½	11½	West Cowes - {	10 45	12½	9½
Saltash, R. Tamar	5 45	15	11		11 45		
Cargreen "	5 47	14½	10½	Lymington - {	10 25	8	6
Pentillie "	5 55	13½	9½		12 15		
Calstock "	6 6	12½	8½	Beaulieu - - {	10 25	10	8½
Morewellham "	6 12	10½	6½		12 15		
Weir Head "	6 17	5½	1½	Calshot - - {	11 30	13	9½
Warleigh Quay, }				(Castle Point) }	10 30	13	9½
R. Tavy }	5 47	14½	10½	Southampton - {	12 45		
Maristow "	5 47	8½	4½		10 42	8½	6
Bigbury B., R. Yealm	5 37	16½	11½	bridge - - {	12 57		
— R. Erme	5 40	16½	11½	Portsmouth Dock	11 41	12½	10
— R. Avon	5 47	16½	11½	Yard - - }			
Bolt Head - -	5 45	15?	11?	Port-			
Salcombe - -	5 41	15	11½	chester (off the	11 46	13½	10½
— Kings- }				Castle) - - }			
bridge - - }	5 46	10		Ports-			
Dartmouth - -	6 16	14½	10½	bridge (a ½ mile	11 48	6½†	4†
				W. of bridge) - }			

* By the Rise of the tide is meant its vertical rise above the mean low water level of spring-tides.
† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Portsmouth Fareham (in Channel close to the Upper Quay) -	h. m.	ft.	ft.	Milford (St. Ann Lighthouse) -	h. m.	ft.	ft.
Bridge -	11 48	11½	8½	Pembroke Dk. Yard	5 56	24	18
Ryde -	11 51	7½	4½	Benton Castle, Cleddau R. }	6 12	21	15½
Bembridge Point -	11 20	13½		Landshipping „	6 23	20	14½
Chichester -	11 0	14	10½	Little Milford Quay „	6 27	20	14½
Pagham (entrance)	11 30	14	11	Haverfordwest „	6 31	19	13½
Selsea Bill -	11 30	16½	12½	Smalls Lighthouse „	6 42	7½	2½
Littlehampton -	11 45	16½	12½	Ramsay Sound -	6 0	21	
Arundel (Bar) -	11 36	16	11½	Fishguard -	6 0	17	
Arundel (Town) -	11 35	16	11½	Newport -	6 56	11½	8½
Shoreham -	12 25			Cardigan -	7 0	12	9
Brighton -	11 34	18	13½	New Quay -	7 1	12	9
Newhaven -	11 15	19½	16	Aberystwyth -	7 30	15	
Beachy Head -	11 51	20	15	Aberdovey -	7 31	13½	10
Hastings -	11 20	20	15	Sarn-y-bwch Reef -	8 0	15	
Rye Bay -	10 53	24	17½	Barmouth -	7 40	14	
Dungeness -	11 20	22	17½	Sarn Badrig -	7 41	17	13½
Folkstone -	10 45	21½	19	Port Madoc -	7 30	13	
Dover -	11 7	20	16½	St. Tudwall Road -	7 30	17	
Deal -	11 12	18½	15	Pwllheli -	7 45	14	
Ramsgate -	11 15	16	12½	Bardsey Id. -	7 46	13½	9½
	11 44	15	12	Porth-dyn-lleyn -	7 40	15	
<i>England and Wales, West Coast.</i>				Caernarvon -	8 30	16	
Scilly Isles (St. Agnes) -	4 30	16	12	Holyhead -	9 33	13½	10½
Scilly Isles (St. Mary) -	4 27	16	12	Amlwch -	10 11	16	12½
Cape Cornwall -	4 35	18?	13?	Beaumaris -	10 30	18?	13?
St. Ives -	4 44	21	15	Air Point, R. Dee	10 32	21½	16½
Padstow -	5 13	20½	16½	Chester (Crane Wharf) -	10 54	25	19
Boscastle -	5 15	25	17½	Liverpool -	12 16	26	
Budehaven -	5 45	23	17	Formby Point -	11 23	26	20½
Lundy Island -	5 15	27	20	Ribble Lighthouse	10 35	28	
Barnstaple (Bar) -	5 30	19	14	Preston -	10 51	24	17
Barnstaple (Bridge)	6 28	10½	7½	Fleetwood (Wyre Lt)	11 49	10	4½
Appledore -	5 58	23	16½	„ (Port)	11 11	27	20½
Bideford -	6 7	16	12	Lancaster -	11 12	26½	19½
Ilfracombe -	5 42	27½	21½	Poulton-le-Sands -	11 16	8½	
Minehead -	6 30	35	26½	Piel Harbour (Pier)	11 26	27½	21½
Bridgewater Bar -	6 50	35	26½	Whitehaven -	11 5	28	21
Weston-super-mare	6 54	37	28½	Port Harrington -	11 14	23½	19½
Flatholm Islands -	6 54	37?	28?	Workington -	11 5	26	19
Portishead -	7 16	41½	31	Maryport -	11 4	20	15
Bristol (King Road)	6 56	44	33	Abbey Head -	11 3	18	13
Chepstow -	7 30	38	28½	Southernness -	11 10	23	17½
Newport -	7 10	38	29	Annan Foot -	11 20	28	
Cardiff -	6 59	38	29	Port Carlisle -	11 56	20	14
Barry Island -	6 39	35½	26	Point of Ayr -	12 10	20	14
Nash Point -	6 25	33	25	Douglas, I. of Man	11 7	20?	16?
Swansea (Mumbles Lighthouse) }	6 1	27½	20½	Ramsey „	11 12	20½	16
Porth Cawl -	6 8	28½	21½	Peel „	11 12	19½	16
Burry Port -	6 1	25½	18½	Calf Sound „	11 8	16½	13
Ferry Side -	5 49	23	16½	Port St. Mary „	11 17	16½	13
Llanelly (Bar) -	6 16	28	21	Castletown „	11 10	20	16
Caermarthen (Bar)	6 10	26	19½				
Caldy Island -	6 0	24?	16?	<i>Scotland, West Coast.</i>			
Tenby -	6 0	27	20	Solway (Tarn Point)	11 22	23	18
				Kirkcudbright -	11 10	23	
				Newton Stewart }	12 0	12	6
				(Carty Quay) - }			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wigton - -	11 30			Tobermory, Mull I.	5 36	13	9½
Garliestown -		17	12	Loch Cuan - -	5 36	13	9½
Port William -	11 10	18	10	Strontian, L. Sunart	5 40	13½	
Mull of Galloway -	11 15	15?	12?	Iona Sound -	5 11	11½	8½
Port Patrick -	11 10	15	12	Bunessan - -	5 24	12	8½
Loch Ryan - -	11 12	11	8	Loch Tuadh (Go- metra) I. of Mull }	5 29	11½	8
Mull of Cantyre -	10 35	4		Scarnish, Tiree I.	5 31	12	9
Campbellton -	11 45	8½	6	Arinagour, Coll I.	5 41	12½	9½
East Loch Tar- bert, Argyleshire }	11 53	9		Loch Moidart -	5 44	13½	9½
Lamlash - -	11 49	10	7	Eigg Island -	6 15	14	10
Ayr - - -	11 50	8½	7½	Arasaig - -	5 50	13½	10
Troon - - -	11 50	10	7½	Loch Nevis - -	5 47	14½	10
Ardrossan - -	11 45	10	8	Loch Hourn -	5 45	13½	10½
Garroch Head -	11 49	10		Ornsay, I. of Skye	5 50	14½	10½
Millport, Great }	11 50	10	6	Kyle Rhea -	6 0	15	11
Cumbræ - - }	11 50	10		Loch Duich -	6 0	15½	11
Largs - - -	11 50	10		Loch Alsh (Kyle Akin) - - }	6 16	15½	11
Greenock - -	0 8	9½	8½	Loch Carron }	6 29	16½	11½
Port Glasgow -	0 18	9		(Plockton) - }	6 32	15	10½
Dumbarton -	0 20	9		Portree, I. of Skye	6 20	14½	10½
Bowling - -	0 39	9		South Rona, Light }	6 20	14½	10½
Renfrew (Canal Ent.)	1 15	9		House - - }	6 20	15	11
Glasgow - -	1 25	9	7½	Loch Torridon -	5 48	11½	8½
Loch Long - -	12 6	12	6	Barra, North Harb.	5 44	11½	8½
Loch Goil - -	12 6	10		" Castle Bay -	6 19	14	9½
Loch Strivan -	11 55	6		Canna Island -	5 47	12½	9½
Burnt Isles, Kyles }	11 50	10	8	Loch Boisdale, }	6 3	11½	8½
of Bute - - }	11 50	9	6	South Uist - }	5 52	12½	9
Skip Ness - -	11 53	9	7½	Benbecula -	6 7	15½	11
Ardishaig, L. Fyne	12 0	10		Loch Dunvegan }	5 59	13½	9½
Inverary - -	2 22	4	2½	(Dunvegan Cas- tle, I. of Skye) }	5 44	12½	8½
Gigha Sound -	2 30	1-4		Loch Eport, N. Uist	6 6	12½	9½
West Loch Tar- bert, Argyleshire }	5 0	5	4	Loch Maddy, N. Uist	6 6	12½	9½
Port Ellen, Islay -	4 41	6½	4½	Vallay - -	6 10	11½	8½
Jura, Feolin Ferry	5 3	3½	2½	Berneray I. (Sound of Harris) - }	6 11	13	9½
" Small Isles -	4 49	6½	5	Obb of Harris -	6 16	11½	8½
Crinan - - -	5 2	11½	7	East Loch Tar- bert, Harris Id. }	6 10	13½	10
Noamh Island -	5 18	11	7½	West Loch Tarbert	6 4	11½	8½
Colonsay (Schal- lasaig) - - }	5 28	10	7½	Loch Seaforth }	6 16	15	10
Carraig - - -	5 10	10-12		(Athline) - }	6 9	14½	9½
Eastdale Sound -	5 31	9	6½	Loch Clay - -	6 39	14½	10½
Ardintallan, Loch }	5 22	12	9½	Loch Ewe (Poolewe)	6 40	14½	10½
Peochan - - }	7 3	5½		Loch Broom }	6 37	14	10½
Oban - - -	7 54	12½	8½	(Ullapool) - }	6 40	14	11
Stonefield, Loch Etive	5 26	11		Tanera, Summer I.	5 54	13½	10
Bunawe - - -	5 43	12	8½	Loch Inver -	6 43	15½	11½
Port Appin, Loch }	6 28	11½		Loch Erisort, }	6 46	13½	9½
Linnhe - - }	5 43	10		Lewis Id. - }	6 11	11	8
Ballachulish, }	5 59	13½	10½	Stornoway - -			
Loch Leven }	6 27			Loch Roag (Ber- nera) Lewis I. - }			
" Head of Loch	5 0						
Corran, Loch Aber	5 33						
Corpach - -							
Loch Eil (Head of Loch) - - }							
Duart, I. of Mull -							
Loch Aline - -							

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
St. Kilda -	5 30	12	11½	<i>England, East Coast.</i>			
Rockall -	3 30	15	11½	Holy Island Harb.	2 30	15	11½
Loch Laxford -	6 44	15½	11	North Sunderland	2 30	15	11½
Cape Wrath -	7 30	14½	11	Coquet Road -	3 0	14½	11
Loch Eriboll -	7 43	15	12	Blyth -	3 15	15	11
Loch Tongue -	7 53	13½	9½	Tyne River (Bar)	3 20	14½	11½
Thurso -	8 28	7½	6	" North Shields }	3 23	13½	10
Stroma, S. side -	9 47	10	7	(Low Lt. Hae.) }			
Swona, E. side -	10 24	7½	6½	" Howden -		12	
" W. side -	9 35	11	8	" Walker -		10½	
Great Skerry, E. side -	11 4			" Newcastle -	4 23	10½	
" W. side -	10 53			Sunderland -	3 22	14½	11
<i>Orkneys.</i>				Seaham -	3 24	14½	10½
Stromness -	9 0	10	7½	Hartlepool -	3 28	15	11½
Westness -	9 11	10	7½	Tees River, Bar -	3 45	18	
Kirkwall -	10 9	10	7½	" Middlesbrough	3 55	13	
Deer Sound -	10 30	10	7½	" Stockton -	4 40	11	
Widewall -	9 3	10	7½	Whitby -	3 45	15	11½
Otterswick -	9 13	11	8	Scarborough -	4 11	15½	12½
<i>Shetland Isles.</i>				Filey Bay -	4 20	16	12½
Balta -	9 45	6	4½	Flamborough Head	4 30	16	12
Lerwick -	10 30	6	4	Bridlington -	4 39	16	12
Hillswick, or Urie }	9 45	6½	5	Humber River, }	5 26	18½	15
Firth -				Spurn Point - }			
Scalloway -	9 30	5½	4½	" Grimsby -	5 36	19½	15
Sumburgh Head -	9 45	5	3	" Killingholme	6 2	19½	15½
Fair Isle -	11 0	5	3	" Hull -	6 29	20½	16½
<i>Scotland, East Coast.</i>				" Ferriby Sluice	6 41	20½	
Duncansby Ness -	10 14	8½	6	" Blacktoft -	6 59	16	
Wick -	11 22	10	7½	" Goole -	7 26	13	
Dornock Road -	11 47	11	11	Boston Deep, Clay }		21½	
Cromarty -	11 56	11	11	Hole - }			
Inverness (Kellock Pier) -	12 18	12	9½	" Hob Hole -		17	
Harbour -	0 28	10½	8	(Sluice) -	7 0	12	
Fraserburgh -	0 40	11	8½	Lynn Deep, Long }	6 0	23	
Peterhead -	0 34	10½	8½	Sand - }			
Aberdeen -	1 0	12	10	" Lynn Road -		20	
Stonehaven -	1 10	14	11	" Lynn -		18	
Montrose -	1 25	13	10	Wisbeach Eye -		20	
Arbroath -	1 35	14	11	Sutton Bridge -		18	
Tay River (Bar) -	2 6	16	11	Wisbeach -	7 30	15	
Broughty Ferry -	2 22	14½	11½	Wells Bar -	6 20	16	
Dundee -	2 32	14½	11½	Wells -	7 0	18	
Firth -	3 35			Blakeney Bar -	6 30	15	
Cockenzie, Firth of }	2 16	15½	13	Blakeney -		9	
Forth -				Cley -		5½	
Leith -	2 17	16½	12½	Cromer -	7 0	14½	11
Granton Pier -	2 20	16	12½	Leman Shoal -	6 0		
Barntisland -	2 24	16½	12½	Ower Shoal -	6 30		
Queensferry -	2 37	14	11	Hammond Knoll -	7 40		
" -	2 53	17½	15	Winterton Ness -	8 25	7½	6½
" -	3 18	17½	15	Yarmouth Road -	9 15	6	4½
" -	3 52	7½	4½	" Haven, Brush		5½	4½
" -	2 8	14½	11	Bridge -		5	4
" -	2 15	15½	11½	Lowestoft -	9 57	6½	5½
" -	2 18	18	11½	Blyth River, South }	10 20	6½	4½
				wold - }			
				Aldborough -	10 45	8½	6½
				Kentish Knock -	11 47		
				Orfordness -	11 15	8	6½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Hollesley - -	11 30	8?	6?	Youghal - -	5 14	12½	10
Orford Haven Bar	11 30	7½		Ballinacourty, } Dungarvan - }	5 12	12½	9½
Orford Quay -	12 36	7½		Dunmore - -	5 27	12½	9½
" Slaughden -	1 0	7½		Waterford (Dun- } cannon Fort) - }	5 20	12½	10
" Snape Bridge	3 0	6		— (Bridge) -	6 6	13½	10½
Woodbridge or } Bawdsey } Haven Bar }	11 45	12	9	New Ross - -	6 4	12½	10
" Kingston Quay	12 35	10		Saltees - -	5 40		
" Wilford Bridge	12 55	7		Wexford - -	7 21	5	3½
Harwich Harbour	12 6	11½	9½	Kilmichael Point -	8 30	4½	3
Orwell River, Pin- } mill - }	12 20	12		Arklow - -	8 45	4	3
" Downham } Reach - }	12 27	12		Wicklow - -	10 29	9	6½
" River, } Ipswich - }	12 35	13½		Bray Head - -	10 45	12	9½
Stour River, } Wrabness - }	12 29	12		Dalkey Island -	10 45	13	11
" Mistle Quay	12 48	11½		Kingstown - -	11 10	11	8½
" Cattawade } Bridge - }	1 8	4½		Dublin Bar (Pool- } beg Lt. House) }	11 12	12 - 14	9 - 11
The Naze - -	12 6	12½	10	Howth Harbour -	11 9	13	10
Colne River, Colne } Point - }	12 0	14	10	Malahide Inlet -	11 15	10	8
" Wivenhoe -	12 10	15	10½	Rogerstown Inlet -	11 15	10½	8
Blackwater River, } Scales Point - }	12 0	14½	10	Skerries Islands -	11 0	13	10
" Heybridge -	12 20	12	8	Balbriggan - -	10 40	11	
Chelmer River, } Maldon - }	12 32	10	6	Drogheda (Bar) -	11 0	11½	9
Gunfleet Sand, N.E. } end - }	11 40	12	8	Dundalk - -	10 56	13½	11½
Crouch River, } Foulness - }	12 5	14½	10½	Greencastle Point	11 2	14	11½
" Hull Bridge	12 25	16	11	Carlingford (Bar) or Cranfield Point.	11 0	14	11
Maplin Light -	12 5	14½	10½	" Warrenpoint -	11 10	14½	12
Margate - -	11 40	15½	13	Newcastle - -	11 4	14½	12
Pansand Hole -	12 0	15½	13	Ardglass - -	11 0	16	12
Nore - -	12 30	15½	13	South Rock - -	10 58	13	10½
Sheerness - -	0 37	16	13½	Lough Strangford } (Killard Point) }	10 53	14	11½
Chatham - -	1 2	17½	14	" Strangford } Quay - }	12 31	10½	8½
Gravesend - -	1 10	17½	14	" Quoile Quay	12 45	11	9½
Woolwich - -	1 37	18½	15½	" Kircubbin	12 42	11½	9½
Greenwich - -	1 43	19	15	" Killyleagh	12 40	11	9½
London Docks -	1 57	19½	17	Head of the Lough } (Turley Rocks) }	12 44	11½	9½
London Bridge -	2 7	19½	16½				
<i>Ireland, South and East Coasts.</i>				<i>Ireland, West Coast.</i>			
Cape Clear - -	4 0	9	6½	Cape Clear - -	4 0	9	6½
Baltimore - -	4 23	10½	8½	Skull - -	4 2	9½	7½
Castletownsend -	4 21	10½	8	Crookhaven - -	4 9	9½	8
Clonakilty Bay -	4 30	11	8½	Dunmanus Harbour	3 57	9½	7½
Courtmacsherry -	4 36	10½	8½	Dunbeacon - -	3 51	10½	7½
Kinsale - -	4 43	11½	9	Black Ball Harbour	3 40	9½	7½
Queenstown - -	5 1	11½	9	Castletown, Bear- } haven - }	4 14	9½	7½
Cork, (Penrose } Quay) - }	4 58	12½	10	Bantry Harbour -	3 47	10	7½
Ballycotton -	4 54	12	9½	Kenmare R., Bal- } lycrovane }	3 42	10½	7½
				" Dunkerron	3 45	10½	8
				" Ormond -	3 43	10	7½
				" West Cove	3 52	10	7½
				Ballinskellig Bay -	3 40	12	7½

Place.									
Valentia Harbour -									
Ventry -									
Blasket Islands -									
Dingle -									
Smerwick -									
Tralee Bay (Fenit)									
R. Shannon, Kil-									
baha -									
" Kilrush -									
" Carriga-									
holt -									
" Tarbert -									
" Foynes Id									
" Mellon -									
" Limerick									
Liscanor Bay -									
Mutton Island -									
Galway -									
Killeany, Arran Ids.									
Cashla Bay -									
Kilkieran Cove -	2 34	10 2	11 1						
Greatman Bay -	4 39	15 1	10 1						
Roundstone -	4 28	13 1	10 1						
Slyne Head -	4 30	13 1	10						
Clifden Bay -	4 30	13 1	10						
Ballynakill Bay -	4 40	12 1	9 1						
Inishbofin -	4 34	12 1	9 1						
Inishturk -	4 36	12 1	9 1						
Clare Island -	4 38	12 1	9 1						
Westport -	4 57	12 1	9 1						
Achillbeg -	5 14	10 1	8						
Bulla Mouth, }									
(N. entrance of }									
Achill Sound) - }	5 38	10 1	7 1						
Blacksod Bay }									
(Quay) - }	4 47	10	8 1						
Broadhaven Harb.	5 0	10 1	7 1						
Killala Bay -	5 22	10 1	8						
Sligo Bay, (Mul-									
laghmore) - }	5 18	11 1	8 1						
Ballysadare (Quay)	6 0	8 1	5 1						
Sligo Harbour }									
(Oyster Island) }	5 23	11 1	8 1						
Ballyshannon (Bar)	5 18	11 1	8 1						
Donegal Harbour }									
(Salthill Quay) }	5 18	11 1	8 1						
Teelin Harbour -	5 16	11 1	8 1						
Killybegs -	5 16	11 1	8 1						
Lough Rossmore -	5 20	11	8						
Rutland Island -	5 22	11	8						
Gweedore (Bunbeg)	5 32	11	8						
Ireland, North and East Coasts.									
Ballyness (Bar) -	5 22	11 1	8 1						
Sheephaven -	5 32	11 1	8 1						
Mulroy Bay, (Bar)	5 40	11 1	8 1						
" Fanny Hole -	6 17	9 1	8						
" Seamount Bay	6 44	7 1	2 1						
" Cranford Bay	8 3	4	2 1						
Rathmullan, Lough }									
Swilly - }	5 42	12 1	9						
					France, North Coast.				
					Ushant -	3 32	19 1	13 1	
					Abervrach -	4 14	22	16	
					Ile de Bas -	4 49	23	17	
					Roscoff -	4 46	23	17 1	
					Morlaix Road -	4 53	24	18	
					Ploumanach -	5 15	24 1	18 1	
					Ploughrescan -	5 17	25 1	18 1	
					Trégulier -	5 32	25	18 1	
					Héaux Lights -	5 45	31	23 1	
					Bréhat -	5 51	31	23 1	
					Paimpol -	6 0	31	23 1	
					Portrieux -	6 0	31	23 1	
					Binnic -	6 3	30	22 1	
					Dahouet -	6 5	32	23 1	
					Erqui -	5 59	33 1	24 1	
					St. Malo -	6 5	35	26	
					Les Minquiers -	6 6	35	26	
					Cancalle -	6 20	37	27	
					Iles de Chansey -	6 9	37	27 1	
					Granville -	6 13	37	27 1	
					Régneville -	6 20	35	26	
					St. Germain -	6 20	34	25	
					Carteret -	6 25	31	23 1	
					Ecrehoux -	6 32	31	22 1	
					Jersey, Rosel -	6 15	30	21 1	
					" St. Helier -	6 36	31 1	23	
					Difletta -	6 40	27	20 1	
					Goury -	7 6	22	17 1	
					Omonville -	7 29	15 1	12 1	
					Guernsey (St. }				
					Peter Port) - }	6 37	26	18 1	
					Casquets -	6 45	15 1	12 1	
					Alderney -	6 46	17 1	12 1	
					Cherbourg -	7 49	17	13 1	
					Barfleur -	8 51	17	13 1	
					La Hougue -	8 42	16 1	14 1	
					St. Marcouf Is. -	9 55	20		

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port-en-Bessin -	8 57	20	15½	Elbe, Hamburg -	5 29	6½	
Courceulles -	9 7	20	15½	Eider, Tønning -	2 1	9	
Oystreham -	9 38	21	16	„ Friederich- stadt -	2 37	9	
Merville -	9 36	21	17¼	Eider, Rendsborg -	7 42	4	
Dives -	9 39	21	16	Husum -	2 36	9	
Honfleur -	9 29	23½	18	List -	2 21	6	
Quilleboisuf -	10 6	9½	7½	Hierling -	2 45	5	
Caen -	10 57			Nyminde Gab -	2 41	2	
Håvre -	9 51	22	18	Thorsminde -	3 34	2	
Rouen -	2 28			Blaavand or Horn Point -	1 44	5	
Fécamp -	10 44	23½	18	Aggerminde -	4 9	2	
St. Valery-en-Caux	10 46	27	21½	Hirtshals -	4 28	1	
Dieppe -	11 6	27	20½	Skagen or the Skaw	5 56	1	
Tréport -	11 9	27	21	Bergen -	1 30	4	
Cayeux -	11 5	27½	21	Romdals Islands -	10 45	6	
Hourdel -	11 26	27½	21	Ramso Fiord -	10 45	7	
St. Valery-sur- Somme. }	11 46	27	21½	Oxbaasheia, Svee Fiord -	12 0	8	
Boulogne -	11 25	25	19½	Trø Islands -	11 45	7	
Cape Grisnez -	11 27	21½	16½	Værø -	12 0	9	7½
Calais -	11 49	19½	15½	Lofoten Islands -	12 0	9	7½
Gravelines -	12 0	19	15	Tromsø -	1 45	8	
Dunkerque -	12 8	16½	13½	Hammerfest -	1 10	9	
<i>North Sea, East Coast.</i>				<i>Færoe Islands.</i>			
Nienport -	12 18	16	13	Fugloe Fiord -	11 15	6½	4½
Ostend -	12 25	19	15	Svinøe Fiord -	12 0	6½	4½
Blankenberg -	12 48	13	11	Leervig Fiord -	0 30	6½	4½
Bathz -	3 15	15		Miaveness -	3 12	6½	4½
Flushing -	1 20	15		Naalsoe Fiord -	4 0	6½	4½
Antwerp -	4 25	15		SkaapenFiord(be- tween Stormoe and Sandoe) -	5 0	9½	7½
Veere -	1 20	15		„ (between Hestoe and Sandoe) -	5 30	9½	7½
De Roompot -	12 30	12	8	Waagoe Fiord -	6 0	9½	7½
Zieriksee -	2 0	11	9	Westmanshaven -	8 0	9½	7½
Brouwershaven -	2 15	10	8	Suderoe Fiord -	6 0	9½	7½
Goeree (West Gat)	1 45	7		Myggenæs Fiord -	9 0	9½	7½
Hellevoetalsuis -	2 30	8	6	Eides Fiord -	11 0	9½	7½
Brielle -	3 0	5		<i>Iceland.</i>			
Rotterdam -	3 45	7		Reikiavik -	5 0	17½	18½
Katwyk -	2 30	5		<i>Lapland.</i>			
Texel (outside shoals)	6 30	4	3½	Liza Bay -	5 58	9	
Kykduin -	7 0	12		Nova Zembla Harb.	6 36	10	
Nieuwediep -	7 27	4	3½	Jekatarina Islands	6 23	10	
Terschelling (West)	8 40	6	5	Kildin Island -	6 45	12	
Ameland Gat -	9 0	7		Habitable Island, } Seleney Bay - }	7 9	9	
„ Hollum Rd.	11 30	7		Teriberka River -	7 20	12	
Ems (outer buoy) -	10 0	8-10		Olenji Islands -	7 30	12	
Borkum (road) -	10 30	8-10		Charlowka River -	8 8	12	
Delftyl -	11 15	8-10		Seven Islands -	8 20	12	
Emden -	12 0			Jukan Islands -	9 0	13	
Norderney -	10 30	8		Sviatoi Nos -	9 15	14	
Weser, outer light vessel - }	11 30						
Wanger Oog -	12 0	9½					
Helgoland -	11 33	9½	7				
Elbe, entrance -	12 0	11					
„ Cuxhaven -	1 8	10					
„ Brunsbüttel -	1 58	9					
„ Glückstadt -	8 9	10					
„ Altona -	5 19	7					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
White Sea.					h. m.	ft.	ft.
Inkanskie -	9 15	14		Port Alexander -	3 0	5	
Turna Bay -	9 54	11		Great Fish Bay -	2 30	5 - 6?	
Trek Island -	10 48	20		Little Fish Bay -	2 30		
Litke Bank -	11 45	15		Lobito Bay -	2 20	5	
Cape Kanushin -	11 54	15		Benguela -	2 30	5?	
Sosnovets -	11 44	18		St. Helena Island -	3 11	3	
Morjovets I. -	11 20	17		Ascension Island -	5 30	2	
Cape Voronov -	11 20	17		San Paul de Loanda -	4 30	5	
Intsi Point -	11 55	16		River Congo -	4 30	6	
Kouloi River -	1 15	20		Loango Bay -		6½	
Mezen -	1 48	15 - 22		Mayumba -		7	
Kerets Point, Gulf } of Arkhangel - }	4 30	5½		River Gaboon -	5 30	3	
Nikolskoi Tower "	6 0	2		Cape Lopez -	4 30	4 - 6?	
Moudiuga I. "	5 50	3¼		Corisco Bay } (Elobey Isles) - }	5 0	7	
Dvina Bar -		3¼		Anno Bom Id. -	3 45	5	
Arkhangel "	7 28	2½		St. Thomas Id. -	3 25	4½	
Nikolskoi Chan. "	5 25	3		Princes Id. -	3 45	4½	
Gribanika Pt. "	4 50	3		Fernando Po -	4 0	7	
Jijginsk I. -	5 15	4		Cameroon River -	4 0?	6	
Cape Orlov Letni, } Gulf of Onega - }	5 18	4		Bonny and New } Calabar Rivers - }	5 0	9	
Onega River -	9 17	6 - 7		Brass River -	4 0	6	
Souma -	6 30	5½		River Niger, Nun } (entrance) - }	4 8	6	
Solovet Road -	5 0	4		" Middleton -	4 15	5	
Kyem River -	5 23	4		" Pennington -	4 15	5	
Kalgalaksha -	6 50	7		" Dodo -	4 17	5	
Keret, Gulf of } Kandalak - }	3 8	6		" Ramos -	4 20	5	
Kovda Bay -	3 25	6		" Forçados -	4 22	5	
Kandalaksha "	3 25	7		" Benin -	4 30	7	
Sosnovaia Bay "	2 40	6		" Lagos (Bar) -	6 0	3	
Kou Zomen -	3 30	6		" " Consulate } Wharf }		2	
Tetrina -	3 17	7		" Palaver Ids. -		1	
Nova Zembla.				Cape Coast Castle -	4 30	6	
Hakluyt Head -	1 30	4		St. George d'Elmina -	4 30	6	
Spitzbergen.				Cape Three Points -	4 0	4	
Bell Sound -	8 56	3¼		Axim -	4 30	4	
Danes Id., South } Gat - }	0 24	5½		Grand Lahou -	4 20	4	
Africa, West Coast.				Tabou River -	4 45	3 - 4	
(From Cape of Good Hope to the Northward.)				Cape Palmas -	4 30	4	
Simons Bay -	2 44	5½	3½	Sinou -	5 0	4	
Hout Bay -	2 20	5		Sangwin River -	5 15	4	
Table Bay -	2 40	5		Grand Cestos -	5 20	4	
Saldanha Bay -	2 0	6		Edina -	5 50	4	
St. Helena Bay -	2 30			Junk River -	5 45	5	
Roodewall Bay -	2 30	6½		Monrovia -	6 0	6	
Hondenklip Bay -	2 30	5½		Gallinas River -	6 45	4	
Mc. Dougall Harb. -	2 30	5½		Gilmorris Id. }	6 0	11	
Port Nolloth -	2 30	5½		Sherbro River - }			
Elizabeth Bay -		5 - 6		Edmonstone Id. "		8	
Angra Pequena -	2 30	8		Bagroo River "		11	
Ichabo Island -	1 0	6	4	Banana Islands -	8 15	9	
Spencer Bay -	10 50	5 - 6		Sierra Leone -	7 55	8	
Port d' Ilheo -	3 0	8 - 10		Yellaboi Island -	7 10	10	
Walvisch Bay -	1 54	6		Scarcies Rivers -	7 10	10	
				Mellacoree R. -	7 40	11	
				Forecarreah R. -	7 40	11	
				Mahneah R. -	7 40	11	
				Isles de Los -	6 35	13	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
River Ponga -	7 30	12	9½	Oporto -	2 30	10	
" Nunez -	10 0	15	11½	Fayal, Azores -	11 45	4	
" Compoee -	10 0	15	11½	Terceira „ -	12 32	4½	
Bijouga Ids., Or- } ango Channel - }	10 0	11		St. Michael „ -	12 30	6	
" Arcas } Channel - }	10 10	11 - 14	9	Funchal Bay, Ma- } deira - }	12 48	7	
" Bissao- }	11 0	8		Vigo - - - }	3 0	12 - 13	
River Cacheo -	7 45	8		Cape Finisterre -	3 0		
" Gambia -	8 10	6 - 9		Port Camariñas -	3 0	15	
Joombas River -	8 10	6		Corunna - - -	3 0	15	
Salm River -	8 10	6		Ferrol - - -	3 0	15	
Goree - - -	7 45	2½		Cedeira - - -	3 0	15	
Senegal (Bar) -	8 42	6		Vivero - - -	3 0	15	
(Guet } N'dar) - }	8 42	6		Rivadeo - - -	3 0	15	
(St. Louis) }	10 0	6		Barquero (entrance) }	3 0	15	
Sal, C. Verde Ids. }	7 45	5		Gijon Bay - - - }	3 0	14	11
Porto Praya „ - }	6 0?	5		St. Martin de la }	3 30	15	
Portendik - - - }	10 0	6		Arena - - - }			
Levrier Bay - - - }	12 0	6 - 7		Santander - - -	3 30	15	12
Ouro River - - - }	12 0	8 - 9		Santona - - -	3 30	12½	10½
Cape Blanco - - - }	11 46	6		Bilbao (Bar) - - - }	3 0	13	
Cape Bojador - - - }	12 0	8?		Olaveaga - - -	3 15	12	
Cape Juby - - - }		8		Bilbao (Town) - - - }	3 20	9	
Ferro, Canary Ids. }	12 30?	9?		St. Sebastian - - - }	3 0	12	9
Palma „ - - - }	12 30?	9?		Port Pasages - - - }	3 0	12	9
Gomera „ - - - }	12 45?	9?		Socoa - - -	3 19	12½	8
Lanzarote „ - - - }	1 0?	9?		Bayonne (Bar) - - - }	3 45	12	10½
Santa Cruz, Tenerife }	1 30	8	6	Boucaut, Adour R. }	3 39	8½	6
Puerto de la Luz, }				Arcachon - - - }	4 37	11½	9½
Gran Canaria - }	12 52	10		Cordouan Lt. house }	3 37	13½	10½
Santa Cruz or }	12 45	9		Royan - - - }	3 38	13½	10
Agadir - - - }				St. Surin - - - }	4 11	14½	11
Mogador - - - }	1 18	10 - 12		Bordeaux - - - }	6 50	14	12½
Cape Cantin - - - }	10 0	10		Ued'Aix, Charente }	3 20	17	12½
Rabat - - - }	1 46	9 - 12		R. Entrance - - - }			
El Araish - - - }	1 30	9 - 12		Ile d'Oleron - - - }	3 50	19	
Tangier - - - }	1 42	8		Rochefort - - - }	4 6	17	13
Ceuta - - - }	2 6	3½	2½	Rochelle - - - }	3 31	17	13
Tetuan - - - }	2 23	2½	1½	Les Sables d'Olonne }	3 26	14	10
Tunis (Goletta) - }		3		Seudre River (en- }	3 31	15	11½
Sphax Roads - - - }	4 30	5	3	trance, - - - }			
Jerba - - - }	3 10	7	5	Ile d'Yeu - - - }	3 6	14½	10
<i>Europe, West Coast.</i>				Ile de Noirmoutier }	3 2	16	11½
Malaga - - - }	12 0	3		Port Navallo - - - }	3 42	13	9½
Gibraltar, old Mole }	2 20	3½		St. Nazaire - - - }	3 10	15½	11
Algeciras - - - }	1 49	4	2½	Port le Palais, }	3 18	14½	10½
Tarifa - - - }	1 46	6	3½	Belle Ile - - - }			
Cadiz - - - }	1 45	9½		Port Louis, L'Orient }	3 11	13	9½
Rota - - - }	1 24	12½	8	Concarneau - - - }	3 12	13	9½
Salmedina Rocks - }	1 27	12½	8	Penmark Rocks - - - }	3 16		
Chipiona - - - }	1 34	12½	8	Glenan Is. - - - }	3 12	13	10
San Lucar - - - }	1 53	12½	8	Ile de Sein - - - }	3 21	17½	12
Bonanza - - - }	2 0	12½	8	Brest - - - }	3 47	19	13½
Conil - - - }	1 18	11½	7½	Conquet Road - - - }	3 46	21	15
Lagos - - - }	2 7	13		Ushant - - - }	3 32	19½	13½
Setubal - - - }	2 30	8		<i>South America, East Coast.</i>			
Lisbon (Belem) - }	2 30	12	9	<i>(Cape Horn to the Northward.)</i>			
Peniche - - - }	1 54			St. Martin Cove, }	3 50	8	
Mondego (Bar) - }	2 30	7		Cape Horn Ids. }			
				Cockburn Island }	7 50	6	
				(Antartic Ocn.) }			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape Peñas -	6 42	12		*RiodelaPlata, (C. } Castillos) }	8 30	2	
Cape San Diego -	4 30	10		" Buenos Ayres	12 0	3-5	
Orange Bay -	3 30	6		" Barragan Bay	7 0	5-9	
Goree Road -	4 0	8		Rio Grande do Sul		1½-2	
Le Maire Strait -	4 0	7		Santa Catharina I.	2 45	6	4½
Staten Island -	4 30	■		San Sebastian -	2 0	4	
San Sebastian Bay	7 0			Ilha Grande (Es- trella Bay) - }	12 30	5	■
<i>Falkland Islands, East Falkland.</i>				Rio Janeiro -	3 0	4	■
Berkeley Sound -	5 0	7		Porto Frio -	2 40	4½	
Port William -	5 15	7	5½	Macahé -	2 36	9½	
Port FitzRoy -	4 45	6		Benevente -	3 0	■	
Port Pleasant -	5 0	6½		Espirito Santa }			
Island Harbour, } Choiseul Sound }	5 20	6		Bay, and Port }	3 0	4	
Mare Harbour -	6 0	6		Victoria - }			
Darwin Harbour -	6 30	5½		Abrolhos -	3 20	6-7	
Walker Creek -	6 20	5½		Martin Van Rocks	3 45		
Low Bay -	5 0	5½		Os Ilheos -	4 30		
Adventure Sound	5 30	■½		Bahia -	4 15	8	
Bay of Harbours -	6 0	5		Maceio -	4 30	8½	
Falkland Sound N. }				Pernambuco -	4 45	8	6
entrance }	6 45			Parahiba -	5 0	9-12	
" S. entrance	7 0			Cape St. Roque -		8-10	
Ruggles Bay -	7 30	5		Rocas -	5 15	10	
Port King -	7 30	■		Fernando Noronha	4 0	6	
" Sussex -	8 15	6		Aracati -	6 0	8	6
" San Salvador	8 10	8		Ceara -	4 30	9	
" San Carlos -	7 0	■		Jericoacoara -	11 30	12	9
<i>West Falkland.</i>				Maranhão -	7 0	16½	10½
Port Stephens -	7 45	7½		San Joao -	6 24	14	
" Albemarle -	7 15	7		Para -	12 0	11	10½
" Edgar -	7 15	6		Cayenne River -	3 45	6-11	
Fox Bay -	7 0	6		Maroni River -	5 30	8	
Manybranch Harb.	7 40	7½		Surinam -	6 0	5½	
Port Egmont -	7 30	11		Corentyn River -	5 10	8½	6
Hope Harbour -	8 10	7		Rio -	4 30	11½	6
Shallow Harbour -	9 30	6		Demerara River -	4 45	9	6
Ship Harbour, New }				Orinoco R. (entr.)	6 0	3	
Island - }	10 30			Chacachacare Id. }			
				Trinidad }	3 30	4	
				Dragons Mouth -	3 0	4	
				Port Spain -	4 30	4	3
				Tobago -	irr.	3½	
				Cartagena -	11 0	1½	1
				Caledonia Harbour	11 40	1½	1
				<i>Caribbean Sea and the Bahamas.</i>			
				St. Vincent }			
				(Kingstown) - }	3 0	1½	1
				Grenada, (St. }			
				George Harb.) }	2 40	1½	1
				Grenadines -	3 0	1½	1
				Barbados -	irr.	2	
				Martinique (Robert }			
				Harbour) - }		4-5	
				English Harbour, }			
				Antigua - }		2	
				Anegada -	9 0	1½	
				Gorda Sound, }			
				Virgin Island - }	8 30	1½	

-continued.

46	
40	
40	29
30	
18½	
15	
17	
10	25
30	
10	
28	
14	
IV	10
9	7½
12	9
IV	10
8	

a greatly influenced by the winds, the water being raised by S.E. winds causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
Tortola - -	8 30	1½		<i>Bermudas.</i>			
Culebra or Pass- age Island - }	9 0	1		Ireland Id. Dock }	h. m.	ft.	ft.
Christiansted, Santa Cruz - }	7 30	¾		Yard - - }	7 14	4	
San Juan, Porto Rico - - }	8 2	1½		<i>North America, East Coast. (Isthmus of Panama to the Northward.)</i>			
Saintes - -	6 45			Greytown - -	9 0	1½	
Inagua - -	8 0	3½	2½	Blewfields - -	1 50	2	
Mira-por-vos - -	9 30	3	2½	Corn Islands - -	1 45	2	
Turks Islands - -		3		Colombilla Cay, }		2	
Stirrup Cays - -	7 0	4		Pearl Cays - }	2 0	2	
Crooked Island - -	7 0	2½		Cape Gracias Harb.	10 30	2	
Eruma - -	7 20	2½		Royal Harbour, }	7 45	3½	
Royal Island - -	7 45	3½		Ruatan - - }			
Clarence Harbour, }	8 30	4	3½	Serranilla Bank - -	irr.	2	
Long Island - }				Serrana Bank - -		2	
Rugged Island - -	8 0	3		Old Providence - -	irr.	1	
Mucaras Reef - -	7 40	3		Bonacca Island - -	9 0	1½	
Lobos Cay - -	7 40	3		Mugeres Harbour - -	9 30	1½	
Guinchos Kay - -	7 40	3		Cozumel - -	8 30	1½	
Nissan, New Pro- vidence - }	7 30	4	3	Cape Catoche - -	9 30	1½	
S. W. Bay " - -	7 30	4		Campeche - -	1 45	2½	2
Salt Cay Anchorage	8 15	4	3	Sisal - -		2	
Hanover Sound - -	8 15	4	3	Laguna de Terminos	noon	1½	
Douglas Road - -	8 30	4	2½	Triangles - -		1½	
Abaco - -	8 0	3		Arcas Rocks - -	noon	1½	
Man-of-War Cay - -	8 10	4		Vera Cruz - -		2	
Gun Cay - -	8 30	3		<i>United States.</i>			
Memory Rock - -	7 50	3		<i>(Texas, Louisiana, Mississippi, Florida, Georgia, and S. & N. Carolina.)</i>			
Bluff Cay - -	7 0	4½		Brazos R. (entr.)†	irr.	1½	
Puerto de la Plata, }	7 30	3?		St. Luis Pass, Texas†		1½	¾
St. Domingo - }				Galveston - -		1½	¾
Mancenille Bay - -	7 0	4 - 5?		Sabine Pass† - -		1½	
Fort Dauphin - -	7 0	5½	3½	Calcasieu River† - -		2½	1½
Cape Haiti, St. }	6 0	3		Vermilion Bay }		2½	1½
Domingo - }				(entrance)† - }	irr.	2½	
Acapul Harb. " -	6 0?	3?		Atchafalaya Bay† -	irr.	2 - 2½	
Joncaves Bay " -	8 0?	1?		Timballier Bay† -	irr.	2	
Bay of St. Mark " -	8 0?	1?		Barataria Bay }		1½	
Port au Prince " -	8 0?	1?		entrance)† - }	irr.		
Caimites " -	8 0?	1?		Mississippi S. W. pass		1½	¾
Bay of Aux Cayes,,	uncertain	2 - 3?		Biloxi† - -	irr.	2	
Flamand Bay " -	"	2 - 3?		Mobile - -	irr.	1 - 2	
St. Louis Bay " -	"	2 - 3?		Pensacola - -		1½	
Aquin Bay " -	"	2 - 3?		St. Andrews Bay†	irr.	1 - 2	
Macmel " -	"	2 - 3?		St. Georges Sound }		2½ - 4	
Havana, Cuba* -	8 14	3		(west entrance)† }	irr.		
Boa de Varadero,,*	8 39	2		(middle entr.)† }	1 31	1½	1½
Baracoa " -	7 23	2½		Apalachicola Bay -		2½ - 4	
Puerto de Mata " -	6 49	2½		St. Marks† - -	1 14	3	2½
Santiago de Cuba,,*	8 33	2½		Cedar Cays† - -	0 51	3½	2½
Playa de Incia " -	7 31	2½		Tampa Bay† - -	11 21	1½	1½
Puerto de Baiti- queri " - }	9 7	2½		Tortugas† - -	9 56	1½	1
Puerto de Maravi,,*	7 56	2½		Cay West† - -	9 30	1½	1½
Puerto de Taco " -	8 49	2½		Cay West, N.W. }	9 10	1½	1½
Cape St. Antonio,,		1½		Channel† - }			
Port Royal, Jamaica	11 0	1					

* From the Anuario de la Direccion de Hidrografia, Madrid, 1863.

From the United States Coast Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water Full and Change.	Rise.		Place.	High Water Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sand Cay* -	8 40	2	1	Egg Island Light*	9 4	7	5½
Indian Cay* -	8 23	2½	1½	Mahons River* -	9 52	7	5½
Cape Florida* -	8 36	1½	1½	New Castle* -	11 53	7	6½
Lower Mata-				Philadelphia* -	1 18	6½	5½
cumbe Bay* -	8 23	2½	1½				
St. Augustine* -	8 21	5	4	(New Jersey.)			
St. Johns River* -	7 28	5½	5	Cape May Landing*	8 19	6	5
Fort Clinch, Fer-				Cold Spring Inlet*	7 32	5½	4½
nandina* -	7 53	6½	6½	Little Egg Harbour	7 10	4½	3½
St. Simons Island*	7 43	8½	6½				
Doboy Lighthouse*	7 33	7½	7	(Long Island Sound.)			
Savannah (City)* -	8 13	7½	6½	Watch Hill* -	9 0	3	2½
Fort Pulaski, Sa-				Stonington* -	9 7	3½	3
vannah (entr.)* }	7 20	8	7	Little Gull Island*	9 38	3	2½
Hilton Head* -	7 19	7½	6½	New London* -	9 28	3	2½
St. Helena Sound*	7 8	7½	6	New Haven* -	11 16	6½	5½
North Edisto R.* -	7 10	7	5½	Bridgeport* -	11 11	8	6½
Charleston* -	7 26	6	5	Sheffield Island*	10 58	8½	7½
Bulls Island Bay -	7 16	5½	4½	Oyster Bay* -	11 7	9½	8
Georgetown* -	8 40	4½	3½	Sands Point* -	11 13	9	7½
South }				New Rochelle* -	11 22	8½	7½
Island* - - }	7 56	4½	3½	Throgs Point* -	11 20	9½	7½
Wilmington* -	9 6	3	2½				
Cape Fear River }				(New York to Portland.)			
(Smithville)* - }	7 19	5½	4½	Tarrytown* -	9 57	4	3½
Bald Head* - -	7 26	5	4½	New York* -	8 13	5½	4½
Port Royal Sound*:				Sandy Hook* -	7 29	5½	5
Entrance -	7 16	7½	6½	Hell Gate Ap-			
Beaufort -	7 26	3½	2½	proaches*:			
Ocracoke Inlet* -	7 4	2½	2	— Long Island }			
Hatteras Inlet* -	7 4	2½	2	(Blackwells Dk.)* }	9 59	6	5½
				— — N. of Asto-			
(Chesapeake Bay and Rivers.)				ria Ferry* - }	9 48	6½	5½
Cape Henry -	7 40	4		— — Pot Cove, }	10 48	8½	6½
Cape Charles -	7 45	5		(S.E. part)* - }			
Old Point Comfort*	8 17	3	2½	— Wards Island }	10 9	6½	5
James R, City Point*	2 11	3	2½	(Paupers Dock)* }			
Richmond* - -	4 28	3½	2½	Montauk Point* -	8 20	2½	2
York R. (Moody's }				Block Island* -	7 36	3½	2½
Wharf) - - }	9 35	3½		Point Judith* -	7 32	3½	3½
Piawkatank River }				Newport* -	7 45	4½	4
(Cherry Point) - }	10 5	2	¾	New Bedford, en-			
Tappahannock* -	0 42	2	1½	trance* - }	7 57	4½	4
Rappahannock }				Bird Island Light*	7 59	5½	4½
(Saunders Wharf) }	3 2	2½	2	Kettle Cove* -	7 48	5	4½
Point Lookout* -	12 58	2	1½	Cuttyhunk* -	7 40	4½	3½
Annapolis* - -	4 38	1	1	Quicks Hole }			
Chester R. (Rock- }				(S. Side)* }	7 36	3½	3
hall Creek)* - }	5 23	2½	1	" (N. Side)* }	7 31	4½	3½
Patapsco River }				Menemsha Bight*	7 45	4	2½
(Bodkin Point)* }	5 42	1½	1	Woods Hole (entr.			
Baltimore* -	6 33	1½	1½	from Vineyard }	8 34	2	1½
				Sound)* - }			
(Delaware Bay and River.)				— (entrance from }	7 59	4½	4
Cape Henlopen -	8 0	4½		Buzzard Bay)* }			
Delaware Break- }				Tarpaulin Cove* -	8 4	2½	2½
water* - - }	8 0	4½	3½	Gay Head -	7 37	7	
Higbees, Cape May*	8 33	6½	5½	Holmes Hole* -	11 43	1½	1½

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Edgartown* -	12 16	2½	2	Machias, Seal Isd.	11 5	18	14½
Hyannis* -	12 22	4	3	Grand Harbour, }	11 7	21	17½
Nantucket* -	12 24	3½	3	Grand Manan - }	11 12	21	17
St. George Shoals	10 30	7		West Quoddy -	11 16	22½	18½
Monomoy* -	11 58	5½	4	Fish Head, Grand }	11 18	24½	21
Provincetown* -	11 22	10½	9½	Manan - }	11 19	23½	20
Wellfleet* -	11 5	13½	12	Lepreau -	11 21	23½	20
Cape Cod -	11 30	13		(Welchpool) - }	11 21	27	23
Barnstable -	11 22	10	8½	St. John Harbour	11 35	30	25
Plymouth* -	11 19	11½	10½	Quaco -	11 35	37	30½
Boston Light* -	11 12	11	9½	Spicers Cove (near }	11 47	41	34½
Boston (Charles- }	11 27	11½	10	Cape Chignecto) }	11 49	45	38
Marblehead -	11 30	12		Grindstone Island -	11 55	45½	38
Salem* -	11 13	10½	9	Folly Point }	12 15	47	37½
(Doucester Harbour* }	11 4	10½	8½	(mouth of Petit- }			
Rockport* -	10 57	10½	8	coudiac River - }			
Amisquam* -	11 0	10½	9	Cumberland Basin, }			
Ipswich* -	11 26	10½	8½	(Sackville - }			
Newburyport* -	11 22	9	7½	Monckton(Railway)			
Portsmouth* -	11 23	10	8½				
Richmond Island* }	11 30	10½	9				
Portland* -	11 25	10	7½				
Kennebec River }							
(Hanniwells }	11 15	9½	7				
Point)* - }							
Mount Desert Id. -	11 10	13					
<i>Bay of Fundy, Nova Scotia.</i>				<i>Nova Scotia.</i>			
Cape Sable, Bar- }				Negro Harbour -	8 12	7	5½
ington Bay, }	8 27	8½	6½	Shelburne -	8 4	7	5½
(Clam Point) - }				Rugged Island -	7 59	7½	6
Cape Sable, Clarkes }	8 58	11	9	Port Mouton -	7 54	7½	5½
Harbour - }				Liverpool Bay -	7 50	8	5
Pabuico -	9 25	12	10	Port Metway -	7 50	8	5
Argyle, (Jones }	9 27	12½	10½	Cape le Have }	7 48	7	5½
Anchorage) - }				(Spectacle Id.) }			
Seal Island (Cape }	9 49	12½	10½	Le Have, Crooked }	7 51	7½	6
Sable) - }				Channel }			
Ellenwoods An- }	9 54	13	10½	„ Mothers Island	7 51	7	5½
chorage - }				„ Getsons Cove	7 55	7½	6
Jebogue -	10 4	15	11½	„ Bridgewater, }	8 6	8	6½
Yarmouth -	10 9	16	13	McKean's Wharf }			
Sandy Cove E., }	10 33	21½	17½	„ Lunenburg }	7 54	7½	6
St. Marys Bay }				(Spidlers Cove) }			
Petit Passage -	10 41	22	18	Little Tancock Id	7 43	7½	6
Grand Passage -	10 43	20½	17	Mahon Bay, Heck- }			
Sandy Cove, West }	10 47	23	19	mans An- }	7 45	7½	6
Digby Gut -	11 0	27½	23	chorage - }			
Port George -	11 17	32	28	„ Princes Inlet	7 42	7½	6
Ile Haute -	11 21	33	28½	„ Ham Island	7 47	7½	6
Black Rock -	11 29	36	31	„ Martin's River	7 43	7½	6½
Spencers Anchorage	11 42	39	33	„ Chester -	7 44	7	5½
Paraboro, Basin }	12 17	43	37½	Prospect River -	7 43	7	6
of Mines }				Blind Bay -	7 46	7½	6
Horton Bluff „ -	12 30	48	40	St. Margarets }	7 47	7½	6
Noel „ -	12 41	50½	43½	Bay, Shut-in Id. }			
<i>Bay of Fundy, New Brunswick.</i>				Sable Island, N. side	7 30	4	
Seal Cove, Grand }	10 54	20	15	„ S. side	6 30	4	
Manan - }				Halifax Harbour -	7 49	6	5
				Jedore Harbour -	7 45	6½	4½
				Ship Harbour -	7 54	6½	4½
				Sheet Harbour -	8 6	6½	4½
				Liscomb Harbour -	8 0	6½	4½
				Beaver Harbour	7 40	6½	4½
				Whitehaven -	8 0	6½	4½

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	
Canoe Harbour -	7 48	6½	4½	St. Lewis Cape -	6 30		
Crow Harbour -	8 0	6½	4½	Fall Harbour } (Telegraph Pt.)	6 40	3½	
Guyborough -	8 20	6½	4½	Chateau Bay -	7 35	3½	1
Pomquet -	9 15	4	2½	Red Bay -	7 45	3½	1½
Cape George -	9 15	4	2	Bradore Bay -	8 45	4	2
Merigomish -	10 6	5½	3½	Belles Amour Bay	9 0	4½	2½
Pictou Harbour -	10 0	6	4	Bonne Esperance } Harb. -	9 15	5	2½
Caribou Harbour -	10 0	6	4	Mistanoque -	10 30	6	3
Amet Sound -	10 30	8	5	Antrobus Island -	10 30	5	3
Tatamagouche -	10 0	8	5	Wapitagon Harbour	10 30	5	3
Wallace Harbour -	10 30	8	5	Coacocho Bay -	10 30	5	3
Pugwash Harbour	10 30	7	4	Kegashka Bay -	10 45	5	3
Bay Verte -	10 0	9	5	Little Natashquan -	11 0	5	3
<i>New Brunswick.</i>				Appetetat Bay -	11 10	5½	3½
Jourimain Island -	9 30	6	3	Betcheween Har- bour -	11 32	5	3
Shediac Harbour -	{ 1 0 } 8 0	4	2	Clearwater Point -	11 30	5	3
<i>Prince Edward Island.</i>				Mingan Harbour -	1 16	6	4
East Point -	8 30	3½	2	Mingan Island -	1 30	6	4
Cardigan Bay -	8 40	5	3½	Bay of Seven Is- lands -	1 40	9	5
Cape Bear -	9 0	■	3	Anticosti Island } (East Cape) -	1 0	5	3
Hillsborough River:				" Bear Bay -	1 10	5	3
Charlottetown -	10 45	9½	8	" West Point -	2 0	6	4
Head of River -	11 0	10	7	Cawee Islands -	1 50	9	5
Crapaud -	10 0	8	6	Egg Island -	2 0	11	6
Bedeque Harbour -	10 15	7	5	Point de Monts -	12 0	12	6
Minimegash -	3 30	5	3	Cape Chatte -	12 0	13	6
Egmont Bay -	3 0	4	2	Godboat River -	1 52	11	6
Cascumpeque Hr. -	5 40	3	2	St. Nicholas Harb.	1 55	12	7
Richmond Harb. -	6 0	3	2	Manicouagon River	2 15	12	7
Cape Turner -	6 10	4	2	Bersimis River -	2 0	12	7
Grand Rustico -	6 40	4	2	Bic Island -	2 15	14	8½
Tracadie -	7 0	3½	2	Port Neuf -	2 10	13	8
St. Peter Harbour	8 30	4	2½	Matan River -	2 15	11	7
Boughton Harb. -	8 40	5	2½	Little Metis -			
<i>Cape Breton Island.</i>				Saguenay, Tadoussa " Chicoutimi			
Port Hood -	9 0	4½	2	<i>Rio</i>			
Gut of Canso } (Plaister Cove)	9 15	4	2	Magdalen River -			
Mabou River -	9 0	4		Mount Louis Bay			
Chetican -	8 15	3½		(Iron Island) -			
Cape North -	8 0	4		Brandy Pots -			
St. Anne Bay -	8 34	6	4½	Coudres Island			
Sydney Harbour -	8 15	5	4	(Prairie Bay) -			
Menadou Bay -	8 15	5½		Pillars -			
Louisburg Harb. -	8 0	5	4	Crane Island,			
St. Peter Bay -	7 30	6	4	Middle Traverse			
Habitants Harbour	8 20	6½	4½	Orleans Island,			
Arichat -	8 10	5	4	North Traverse			
Bear Head -	8 30	4½	3	Quebec -			
Poulament Bay, }	7 50	6	4	Caronge River -			
Madame Island - }				Frechette Island -			
Grande-digue, " -	7 55	6½	4½	Port Neuf -			
<i>Labrador and Gulf St. Lawrence.</i>				Grondine -			
Eclipse Harbour, }				Cape Roche -			
Antesavick } Sound - }		5		Champlain -			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Batiacan - -	9 48	3½	2	Braha Harbour -	7 0?	2-3?	
Antigonish Harb. -	9 0	4	2	Lunaire Bay -	7 0?	2-3?	
Three Rivers -	11 30	1		Griguet Bays -	7 0?	2-3?	
<i>Gulf St. Lawrence.</i>				Sacred B., (N. Cst.)	7 23	2½	
St. Paul Id. - -	8 0	5	3	Cook Harb. (N.Cst.)	7 25	3?	
Magdalen Islands -	8 20	3	2	Good Bay -	10 40	7½	5½
Gaspé Basin -	2 40	5	3	St. John Harbour	10 40	7½	5½
Point Macquereau -	2 0	5	3	Castors Harbour -	10 50	5?	
Carleton Point -	3 0	6	4	New Ferole Cove	9 28	4½ - 6½	
Dalhousie Harb. -	3 10	9		and St. Marga-			
Campbell Town, } Ristegouche R. }	4 0	10	7	rets Bay -	9 46	5?	
Bathurst - -	3 15	7	4	Old Ferole Harb. }			
Shippigan -	3 42	5½	3	and Brig Bay - }	10 47	5	
Carquette Harbour	2 40	6	3	Port-au-Choix, }			
Misco - -	2 30	5	3	(N. W. Coast) - }	10 41	8½	6½
Miramichi Bar -	5 30	5	3	Cow Head Harb. -			
Sheldrake Island -	6 0	5	3	Petit Port, Bay of }	10 42	5½	
Vin Harbour -	5 45	5	3	Islands - - }			
Beaubère Island -	6 30	6	4	St. George Harb., }	10 3	6¾	4½
Point Escumenac -	4 10	4	2½	W. Coast }			
Richibucto River -	3 30	4	2½	York Harb. "	10 37	5½?	
Buctouche River -	7 0?	4?	2?	Little Port "	10 42	5½	
Cocagne River -	7 30?	4?	2?	Codroy Island -	9 15	6	4
				Port Basque -	8 55	5½	3½
				La Poile Bay -	9 0	6	4
<i>Newfoundland.</i>				<i>Hudson Strait.</i>			
St. Pierre - -	8 33	6½	4½	Button Islands -	6 50		
Lamalin Harbour -	9 15	8½		Fury and Hecla }	7 0	8	
Great and Little }	8 15	7	4	Strait, Melville }			
Laun - - }							Peninsula - }
Great St. Law- }	8 30	7	4	<i>Hudson Bay.</i>			
rence Harbour }				York Factory -	11 15	10-14	
Burin Harbour -	8 45	6½	4½	<i>Arctic Regions, Greenland, West Coast.</i>			
St. Mary Harbour -	7 40	7½	5	Julianshaab -	5 6	7	5
North Harbour -	8 0	7½	5	Frederickshaab -	6 3	12½	9½
Cape St. Mary -	8 30	7	5	Holsteinborg -	6 30	10	
Placentia - -	8 30	7	5	Upernivik -	11 0	8	
Trepassey Harbour	7 0	6½	5	Wolstenholm }	11 8	7½	
Cape Race -	7 0	6½	5	Sound - - }			
St. Johns - -	7 30	6	4	<i>Barrow Strait.</i>			
Harbour Grace -	7 30?	7?		Port Leopold -	12 6	6	4½
Ball Id., Trinity Bay	7 22	3½	2	Erebus Bay -	12 6	8	
Hearts Content "	7 30	4	2½	Griffith Island -	12 15	3¾	2¾
New Perlican }	7 30	4	2½	<i>Melville Island.</i>			
Harbour "							Winter Harbour -	1 30
Trinity Harbour, "	7 10	3½	2	Dealy Id., Brid- }	1 48	4	
Catalina Harbour -	7 0	6	4	port Inlet - }			
Barrow Harbour -	7 10?	5?		<i>Baring Island.</i>			
Fogo Island -	7 20	4		Bay of Mercy -		2	
Funk Island -	7 0?	2-3?		Prince of Wales }		3	
Triton Harbour -	7 0?	2-4?		Strait - - }			
Cutwell Harbour -	7 0?	2-4?					
Fleur de Lis Harb.	7 15	2-4					
Rouge Harbour -	7 0?	2-4?					
Croc Harbour -	6 30	4½					
St. Julien Harbour }	7 21 A.M.	4½	3				
	6 30 P.M.						
Goose Cove -	7 0?	2-3?					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Africa, South Coast.</i>					<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Simons Bay -	2 44	5½	3½	Melinda -	4 0	11	
Dyer Island -	2 50	5		Mombasa -	4 15	11	
Cape Agulhas -	2 50	5		Lamo Harbour -	4 6	11	
Mossel Bay -	3 30	6		Patta Bay -	4 30	10	
Nysna Harbour -	3 45	5		Port Durnford -	4 45	12	
Plettenberg Bay -	3 10	6		Brava -	4 30	8	
Flesh Bay or Bay } St. Bras - }	3 30?	6?		Marka or Muerka -	4 30	8	
Algoa Bay -	3 5	6½		Magadoxa -	4 30	8	
Bird Islands -	4 0	4-5		Warsheek Roads -	4 30	8	
Kowie River -	4 0	4-5		Ras Hafun or Ha-foon -	6 15	4	
Waterloo Bay -	4 0	6		Cape Guardafui or Ras Jerdafoon }	6 15	6	
Buffalo River (entrance) - }	3 45	4½		Bander Aluleh -	6 45	6	
St. John River -	4 0	5		Bander Gori -	6 45		
Port Natal -	4 30	6		Berberah or Burburra (Gulf of Aden) }	7 15	9	
Delagoa Bay, English River (Portuguese Factory) }	5 20	12		Zeyla (Gulf of Aden) -	7 15	8½	
" (Port Melville) -	4 30	15		Ghubbet Ne, Socotra -	7 0	7	
" Shebeen Island -	4 40	12		Gollonsir -	7 20	8	
				Bander Shabab -	7 0	7	
				Abd-al-Kuri -	8 30	6	
				Kal Farun -	8 20	6	
<i>Africa, East Coast.</i>				<i>Madagascar, East Coast.</i>			
Inhambane River -	4 15	10		British Sound -	4 0	9½	
Cape Bazaruto -	4 15	10		Port Leven -	3 30	7½	
Sofala River -	4 0	19		Andrava Bay -	3 30	7	
Quilimane River (entrance) - }	4 15	16		Antongil Bay (Port Choiseni) }	4 0	5	
Zambezi River (Pearl Island) }	4 30	12-15		Tangtang Harbour -	4 30	6	
Lnabo River (entr.) -		22		Madame Island, St. Mary Harbour }	4 0	5	
Angoxa River -		13		Tamatave -	4 18	8	
Antonio River -	3 15	13	10	Fénérine -		3½	
Mozambique Harbour - }	4 15	12		Fort Dauphin -	4 30	7	
Pomba Bay -	4 0	15	11				
Oibo Harbour -	4 15	6		<i>Madagascar, West Coast.</i>			
Mahato Island -	4 30	7		St. Augustine Bay -	4 30	13	
Cape Delgado -	4 0	16	11½	Noas or Sandy Id. -	5 0	15	
Rovuma River -	4 0	16	11½	Cape St. Vincent -	4 45	12	
Pimlea Harbour -	4 30	12		Mourondava -	4 45	12	
Mungullo or }	4 45	12		Barren Islands -	4 45	12	
	4 15	12		Boteler River -	4 30?	15?	
	4 30	12		Boyanna Bay -	4 30	15	
	4 45	12		Makumba River -	4 45	17	
	4 0	10		Bembatooka Bay -	4 30	16	
	4 15	11		Majambo Bay -	4 30	16	
	4 20	10		Narrinda Bay -	4 30	15	
	4 0	11		Port Mazambo -	4 30	15	
	4 15	12		Port Radama -	4 40	12	
				Passandava Bay -	5 0	15	
				Dalrymple Bay -	5 0	15	
				Minow Islands -	5 0	15	
				St. Juan de Nova -		5	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Red Sea.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Bab-el-Mandeb St.	12 0	7		Umm en Nakheh-lah	7 30?	8?	
Mocha Road (East Coast)	12 0	4½		Tahrí	5 0?		
Massowah	1 0	3		Jezírat Kais	0 45	7½	
Loheia	1 30	3		Jezírat Tumb		8	
Sale Macowa	0 30	2		Lingeh	12 0?		
Jiddah		3		Básidúh	12 0	10	
Mardounah Island (East Coast)	6 0	3		Kesm	11 0	12	
Omaider Island (Gulf of Akabah)	6 0	4		Jezírat Lárek	10 15		
Rás Mahommed (Gulf of Akabah)	6 0	5		Basrah Town	6 0?	9	
Ushruff Islands	6 14	2		Jashk Shoal, Beloochistan	9 30	8	
Suez Bay (head of Gulf)	2 0	6		<i>Hindoostan, West Coast.</i>			
<i>Arabia, S.E. Coast.</i>				Karáchi entrance	10 30	9½	6
Bab-el-Mandeb Strt. (Perim Id.)	12 0	7		Gisri River	9 45	10	
Bander Feikam	10 0	8½		Piti River	10 5	9	
Aden & adjacent Bays*	7 30 to 9 30	7	4½	Kúdi River	9 50	10	
Sughrá	8 0	6		Dubba River	10 10	8	
Makátein	9 0	6		Hajamri River	9 40	8	
Rás-al-'Asidah	8 30	5½		Kediwári River	9 57	7	
Makalleh	8 30	7		Waree River	11 0	9½	
Rás Sharmah	9 0	8		Seer River	10 30	11	
Merbát	9 0	6½		" Juggi	1 30	6	
Kuriyán Muriyán Bay & Islands	8 20	6½		Hukkar R., entrance	10 30	11	
Cape Isolette	9 0	10		Kori or Lukput R.: (entrance)	11 15	10½	
Sháb Kadún	9 20	10		Lukput	12 15	12	
Jezírat Hamar-al-nafur	9 30	10		Kotasir	11 15	10½	
Sháb-bu-saifeh	9 45	10		Gooria Creek	11 0	8½	
Ghubbet Hashish	10 0	10		Mandavee Rds.	11 50	15	11
'Om-rasas-Masirah	10 0	10		Toona	1 50	16	13
Rás Shēbali	10 0	10		Hanstul Mouth	2 0		
Rás-al-Hed	9 30	9		Juria	2 0	16	13
Khór Jerameh	9 30	10		Nowanugga	1 45	18	14
<i>Persian Gulf.†</i>				Roji	1 40	18	14
Maskat	11 15	6		Ajár	0 50	14	11
Jezírat Jún	11 30	10		Assar Point	12 0	12	8
Rás al Kheī meh	11 45	7		Seraia	1 0	16	13
Al Bida'	8 30?	6?		Bate Harbour	12 20	12	8
Bahreīn	5 30	7		Mouth of the Gulf	11 30		
Jezírat Arabī	6 30?			Rúpon	10 30	10	7
Jezírat Kabr		8½		Pur Bunder	9 45	6	
Koweit	0 15	9		Mangaról Bunder	10 30	7	5
Basrah (Bar)	12 0			M'hul Dwarka	10 30	7	
Jezírat Kharg or Kháreg	8 0	6½		Mandwa Creek	10 45	7	5
Abú-shehr	7 30	7		Diu Harbour	11 0	6	4½
				Jafrabad Harbour	11 35	9	7
				Shalbet Island	12 0	9	7
				Mowah Bunder	1 0	12	9½
				Goapnáth Point	2 25	18	13½
				Gogah	3 50	Ord. Sp. 27 to 30	21
				Bhowliaree Creek	4 46	30	23
				Singoteer Mata	5 20	24	
				Cambay (Town)	5 10	Night 30 Day 23	

* From a survey of Aden anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

† Deduced from observations made in the E.L.C. brig Euphrates 1857-58, and H.M. schooner Marie of the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiffe of H.M., Indian Navy.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Dhardur R. (entrance) } Gulf of Cambay.	4 30	27	20 - 22	Negapatam -	5 0	3	
Broach Point (Nerbudda River) -	3 40	25		Nagore -	8 15		
Surat Roads -	2 45	19	15	Madras Road -	7 34	3½	
" (Town) -	4 0	19		Pulicat Shoals -	9 25	2½	
Nosari Khari (Bar) -	3 0	18		False Point -	8 0	8	
Gundavi River -	2 0	19	15½	Point Divy -		5	
Bulsar Khari -	1 45	18	14½	Coringa or Cocanada Bay } -	9 10	4 - 5	3
Omersari River -	1 45	18	14½	" River (Bar) -	9 0	5	
Damaun (Bar) -	1 30	17		Balasore River -	10 0	15	
Versovah -	12 0	16	13	Kedgerce -	11 30		
Bombay Dockyard -	11 40	12 - 17		Saugor Island -		12	
Rajpuri R. (entrance) -	10 40	11	6	Western light vessel (entrance to Hoogly) -	10 0	10½	
Bankot or Sivitri River -	10 30	11	6	Mutlah River, Western or Ward's Channel -	9 0	10	
Boria Bay -	10 0	10	8	" (entrance to Biddah River) -	10 0	14	
Ratna-ghiri -	10 30	8	6½	" (Muda Kali) -	11 45	15	
Rajapur R. (entrance) -	11 0	9	7	Calcutta -	2 30		
" (Town) -	12 20	7					
Geriah or Viziadroog -	11 0	9	7	<i>Bay of Bengal, East Coast.</i>			
Deoghur Harbour (entrance) -	11 0	9	7	Hastings Harbour (Mergui Archipelago) -	10 40	13½	
Angria Bank -	10 30	9		Mergui -	10 30	18	
Vingorla -	11 0	8	6½	Tavoy River, (entrance) -	10 30	20	
Goa Bay -	10 30	7	5½	Maulmain " -	2 0	22	17
Sedashigar Bay* -	10 0	6½	5	Martaban -	2 20	21	
Tudri River (Bar) -	10 0	6½	5½	Rangoon R. (entrance) -	3 15	21	14
Mangalore -	11 0	7	5½	Rangoon -	5 30	21	14
Tellicherry -	11 40	5	4	Bassein River (entrance) -	10 0	9	6
Calicut -	12 15	4	3½	Ramree Road -	10 0	12	
Beypore -	12 15	4	3½	Kijouk Phyou Harbour -	10 0	9	6
Cochin -	1 30	2½	2	Akyab, Aracan River (Bar) -	9 45	9	6
Lakadivh Group -	10 30	6	4½	Naafe River (entrance) -	10 0		
				Cheduba Island -	11 30	8	
				Diamond Island -	10 30	8	
				Chittagong (Bar) -	1 15	15	10
<i>Ceylon, South Coast.</i>				<i>Islands in Indian Ocean.</i>			
Colombo -	1 0	2		Kerguelen (Christmas Harbour) -	2 0	2	
Dodandowe Bay -	1 50	1½		St. Paul Island -	11 0	3	
Pointe de Galle -	2 0	2		Amsterdam Id. -	11 0	3	
Belligam or Red Bay -	2 20	2½		Mauritius, Port Louis -	12 30	3	2½
Kirindi -	3 30			" Grand Port -	1 0	1½	
Batticalao River -	5 0	2 - 3		Reunion or Bourbon Island, (St. Pierre) -	Noon	3½	
Trincomalie Harbour -	8 18	2	1½				
Palmeira Point -	9 30	7 - 11					
<i>Bay of Bengal, West Coast.</i>							
Tuticorin Harbour and Road, (Gulf of Manar) -	1 15	2½	1½				
Keelacarry -	11 0						
Paumben Pass -	1 30	2					
Kitnapatnam (West side of Palk Strait) -	11 0	1½					

* Spring tides rise, a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
Reunion or Bourbon Island, (St. Denis)	0 22	2½		<i>Malacca Strait, Malay Coast.</i>			
" (St. Gilles)	1 0	2½		Junkseylon Island (East side)	h. m.	ft.	
" (St. Paul)	1 7	4		Queda	10 0	11½	
Rodrigue Island	1 45	6		Penang (George-town)	12 0	5½	
Cargados Garayos Shoals	2 0	4		Lt. Vessel (One Fathom Bank)	12 0	9	7½
Chagos Archipelago, (Diego Garcia)	1 30	6		Arroa	6 0	15	12
Seychelle Archipelago, (Mayhé Island)	4 0	6½		Cape Rachada	5 30	10	
Curieuse Island	5 10	7		Sambilangs	12	10½	
Peros Banhos	1 30	5		Malacca Road	7 30	11	8½
Amirauté Isles, (St. Joseph I.)	5 0	8½		Off Mount Formosa	8 0	11	8½
Comoro Islands, (Maroni Bay, Comoro)	4 53	10		Tanjong Bolus	9 30	10½	8½
" (Douany, Mohilla)	4 0	11-12		North Sands	5 30	15	12½
Comoro Islands, (Numa-Choa, Mohilla)	3 0	14		Singapore, New Harbour	9 45	10	7½
" (Anchorage, Johanna)	3 40	11		Rhio	10 0	7	5
" (Pomony Harbour, Johanna)	4 0	11		<i>Malacca Strait, Sumatra Coast.</i>			
" Zandzi Anchorage, Mayotta)	4 10	12		Diamond Point	12 0	9½	
Aldabra Islands	5 0	10		Siak River (entrance)	9 0	12	
Maldives, Adou Atoll	1 0	4		" off the town		11	
" Suadiva Atoll	1 0	4		<i>Timor.</i>			
Maldives, Adou Matte Atoll	3 0	4		Koepang	11 0	9	6½
" Malé	12 30	3		Dilhi or Dielli	1 0	6	
" Malcolm Atoll	10 30	3		<i>Sumba or Sandelhout, North Coast.</i>			
" Heawandou Pholo Atoll	9 30	5		Nangamessie Harbour	11 30	17	13½
Laccadives, Cherbaniani Reef	10 0	7	4	Palmedo Road		15	
Tamareed, Socotra	7 20	8		<i>Sumbawa.</i>			
Keeling Islands (Port Refuge)	5 30	5		Ragged Island	8 10	3	
Christmas Id.	10 0			Sapie Bay	1 0	10	
Nicobar Islands, Nancowry Harbour	9 15	8½		Britannia Bay	1 0	11-12	
Andaman Islands, Port Blair	9 30	7½		Bima Bay	Noon	6	
" Port Cornwallis	10 0	8½		<i>Lombok, West Coast.</i>			
" Andaman Strait	10 24	9½		Ampanam Bay	8 0	6	
				Pidloe Bay		10-12	
				<i>Baly.</i>			
				Badong Bay (South Coast)	11 0	9½	
				Tebonkos Road (North Coast)	5 0	6½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Java.				Moluccas.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Pampang Bay -		7-8		Batchian, Gilolo -	1 0	6	
Tylatiap Harb. } (South Coast) -	8 45	3½		Sanguir Island -		6	
Wynkoops Bay } (S.W. Coast) -	5 0	5½	4	Gèby, Fohou Island		5	
Bantam -		5		Manganitoe Bay -	5 0		
Batavia -	10 0	2		Limbé Strait -		5	
Krakatoa -	7 0	4		Sannana Bay -		9	
Sumatra, N.E. Coast.				Koelwatte Bay -		7	
Pulo Aor -		5		Wahaay and Hati- ling Bays -	6 0	3-4	
St. Barbe -	6 0	6		Bouro, Cajili Bay	1 32	4½	
Badas Id., Linga } Bay* -	6 0 P.M.	12		Amboyna -	0 33	7	
Batoo Barra -	2 50	7-10		Saparooa Island -		6	
Dheli River -	8 0	8		Cambing or Pas- sage Island -	noon	6	
Sumatra, West Coast.				Banda, Banda Islands	4 0	6 ?	
Bencoolen -	6 0	3-5		Dampier Strait -		11	
Sillebar River (Bar)	6 0	4½		Filipinas.			
Mensular Island } (S.E. end) -	6 0	4		Port Zebú -	12 0	7	
Tappanoely Har- bour -	6 10	6		Port Buluagan } O'sta Ana -	12 0	5½	
Acheen Head -	8 45	8		Port Iliolo -	12 0	5½	
Diamond Point -	12 0	9½		Port San Jacinto, } Ticao Island -	6 30	6	
Durian Strait.				Mindanao (S. Point)	7 0	6	
Sabon Island -		10		Manila (Luzon) -	10 40	2½	
Deep Point -	5 0	10		Port Sual "		6	
Red Island -	5 0	10½		Scarborough Shoal	11 0	5	
Banka Strait.				Port Laguimanoc "	1 30	5½	
Toboe Ali Point -	8 30 P.M.† 10 0 A.M.†	12	7½	Alabat Harbour "	10 0	9	
Lucipara Pass -	irr.	10		Paluan Bay (Min- doro) -		5	
Nangka Island -	7 0	9½		Busainga (Burias Id.)	12 30	6	
Cape Oelar -	6 30	12		Leo Choo Islands.			
Bersiap Point -	6 30	12		Nafa-Kiang -	6 28	7	
Kalian Point -	8 17†	12½		Port Oonting -	6 35	8	
Lobah Point -	11 0†	10		Oho Sima, Vin- cennes Bay -	7 30	5½	
Gaspar Strait.				Bonin Islands.			
Pulo Mendanao -	2 30	4		Port Lloyd, Peel } Island -	6 8	3	
Pulo Leat -	2 30	4		New Port, Hills- borough Id. -	11 32	3½	
Java Sea.				China Sea, East Coast.			
Crimon Islands -	8 0	6	5	St. Pierre, Island -		4	
Celebes.				Rendezvous Island, } Borneo, S.W. } Coast -		8	
Macassar -	4 0	54½		Tanjong Api -		7	
Flores Sea.				Sarawak River } (Moratabas en- trance) -	4 0	9	5½
Adenara, Flores -		8		" Santubong -	4 0	10	6
				" Sarawak } Junction -	5 0	15-18	9
				" " City	5 20	15-18	9

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig, Saracen.

† In S.E. Monsoon.

‡ In N.W. Monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
Burong Island -	4 45	7		<i>Babuyan Islands.</i>			
Rajang River -	4 45	13	9		h. m.	ft.	ft.
Bruit River -	3 0	11		Port Pio Quinto, Camiguin Island	6 0	6	
Bintula River -	5 45	6		Port Musa, Fuga or New Babuyan		5	
Labuan Island } Victoria Harb. }	9 45	6					
Mungalum Island -	11 0	5		<i>China Sea, West Coast.</i>			
Bruni River -	11 0	12		Romania Point, (Malay Peninsula, E. Coast)	10 30		
Dalawan Bay } (Balabac Island) }	11 0	5		Sedili River (entrance) "	9 44	7	
North Balabac Strait -	10 50	5		Blair Harbour "	8 50	9	
Malludu Bay, Borneo N. Coast }	10 30	6 - 8		Pulo Timoan (West side) -	6 0	7½	
Balambangan Id. -	10 0	6 - 8?		Binkang Bay (Cochin China) -	11 30	5	
Unsang (Borneo, N.E. Coast) -	8 0	3½		Tringano River (Gulf of Siam, West Coast) -	8 0	7	
Ragged Point, Borneo, E. Coast }		7		Menam River, Paknam "	5 7	9½	
Famarung Islands (Borneo East Coast) -		8 - 10		Cape Liant (Gulf of Siam, E. Coast) }	5 7	6½	
Eran Bay (Palawan, West Coast) -	10 10	6½		Chentabun River (entrance) "	10 0	5½	
Tay-bay-oo-bay }	10 15	6		Rocky Island (Gulf of Siam, E. Coast) }	4 0	4	
Ooloogan Bay "	9 30	5½		Pulo Panjang -	7 0	2	
Mayday Bay "	9 55	3½		Pulo Condore (Cochin China)* }	2 30	6½	
Port Barton (Bubon Point), "	10 55	6		Saigon, Cochin China, Cape St. James -	11 0	8	
Pancol "	9 40	6		" Saigon City	5 30	9½	
Bacuit Bay "	10 0	6		Nhatrang Bay (Cochin China, E. Coast) -	8 30	5½	
Cavern Island "	9 30	5½		Hon-cobe Bay "	11 30	5	
Observatory Island -	11 0	5½		Turon Bay "	8 0	4	
Orsula Island } (Palawan, East Coast) - }	11 0	7½		Galang Bay } Hainan Island, }		4 - 5	
Port Royalist -	11 0?	6½?		Yu-tin-kan Bay -	9 5	2½	
Millman Island } (Palawan, West Coast) - }	10 27	2½		Quan-chow-wan, Tongking Gulf }		9 - 10	
Casuarina Point, "	9 30	6½		Namo Harbour -	10 0	7½	
Barren Island "	9 30	5½		Tien-pak Harbour (China, E. Coast) }	12 0	8½	
Bird Island "	9 30	6		Hui-ling-san -	8 15	7½	
Tai-Tai Bay -	9 30	5½		Pratas Shoal -	4 0	5	
Batanes, Bashee Islands -		4		Canton River (entrance) -	10 0	8	
Port Kok-si-kon } (Formosa, East Coast) - }	11 30	8		Broadway River (entrance) -	11 0	7½	
Tam-Sui Harbour }	11 45	7 - 12		Typa Anchorage -	10 0	7	
Keelung Harbour } (Formosa, N. Coast) - }	10 30	8		Macao -	10 0	6½	
San-o Bay -	10 0	3½		Cumsingmun Harbour, Canton R. }	12 6	6½	

* From a French Survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Junk Fleet entr., } Canton River }	11 50	6½		Wan-chu River (ent.)	9 0	15½	
Tailung Channel „	1 30	6½		„ City	9 30	15½	
Lankeet Id., Can- } ton River }	11 20	6½		Towan Island -	9 20	13	
Lintin Id. „	12 0	7½		Tai-chow Islands -	9 0	14	
Fan-si-ak Channel „	1 0	7½	5	St. George Id. }	10 20	15	
Chuen-pee Point „	2 0	7½		San-moon Bay }	10 20	15	
* Wham- { Mar. -	1 40			Kweshan Islands -	9 30	14	
poa Dks. { April -	1 15	7-8		Nimrod Sound -	10 30	20	
{ May &				Vernon Channel,			
{ June - }	0 30			Chusan Archi- }	9 40	14	
Kuper Id. { Mar. -	2 40	5½		pelago - }			
off Canton { May &				Ting-hae Harbour	11 0	12	9
City { June - }	1 40	5½		Poo-to Island -	8 15	12	
Sam-shui, Si Kiang }		5-6		Lansew Bay -	10 0	13	
or West River. }				Volcano Islands -	11 30	15	
Shao-king „ -		3		East Saddle Island	11 0	14	
Wu-chu „ -		1-1½		Yung River, Chin-hae	11 20	12½	
Hong Kong Road -	10 15	4½		„ Ning- }	1 0	9	
Ninepin Group -	10 0	5		po-fu }			
Tide Cove, Mirs Bay	10 0	6½		Hang-chu Bay, }	11 45	14	
Tooni-ang Id. Bias }	8 0			Seshan Ids. - }			
Bay - }				„ Fog }	11 45	17	
Tsang-chow Id. }	8 30			Islands }			
Bias Bay - }				„ Chapu }	12 0	25	
Hong-hai Bay -	10 0	6½		Road }			
Kin-siang Point, }	7 0			Hang-chu Bay }		32	
Hie-chechin Bay }				(off Can-pu) - }			
Cupchi Point -	8 0			Gutzlaff Island -	11 30	15	
Hai-mun Bay -	9 0	7?		Yang-tse Kiang }			10
Cape of Good Hope	9 0	7?		(light ship at }	12 0	15	
Swatau (Double Id.)	3 0	9		entrance) - }			
Clipper Road, Na- }	11 15	7		„ entrance }			
moa Id. - }				to Wusung }	0 30	15	10½
Chanan Bay -	11 0	6½		River - }			
Tongsang Harbour	11 30	12		Pheasant Point, }	0 35	13	8
Chimney Id. Rees }	11 30	12		Wusung River }			
Pass - }				Shanghai - -	0 40	10	7
Makung Harbour }	10 30	9½	7	† Langshan Crossing	1 40	12	8
(Pescadores) - }				Kiu-kiang - -		24	
Amoy, Inner Harb.	12 0	18½	14½	Hankau - -		33-38	
Hu-i-tau Bay -	12 15	16					
Chimmo Bay -	10 20	16					
Chincnu Harbour -	12 25	17					
Meichen Sound -	12 30	17					
Hai Tau Strait -	12 15?	16?					
White Dog Ids. -	9 0	18					
Min River, Tem- }	10 45	19	14½				
ple Point - }							
Min R., Losing Id.	12 0						
Chang-chi Island -	9 30	17					
Spider Island -	10 0	17					
Lishan Bay -	10 15	16					
Namquan Harbour	10 0	17					
Namki Islands -	8 30	17					
Pih-ki-shan Ids. -	8 30	17					
Fong-whang- }							
group, Bullock }	8 30	17					
Harbour - }							

* At Whampoa Docks—In March, the day and night tides rise to the same level. From April to October, the day tides are the higher, and from November to February the lower. In May and June the level of spring tides is 4 feet, and the neaps 2 feet higher than in March.

† At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Acton, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	. h. m.	ft.	ft.		h. m.	ft.	ft.
Ta-tsing ho -	4 10	10½	8	Hakodadi Har-			
Peiho or Peking } River (entr.)* -	3 40	10	7½	bour, Yezo Id. }	5 0	3	
Tien-tsin, Peiho } River - - -	7 0	4½		Endermo Har-	5 30	6	
Peh-tang ho -	3 33	10	7½	bour, Yezo Id. }	10 30	6	
Sha-tui-tien Banks } (west part) -	2 50	10	8	La Perouse Strait -	6 0	6½	4½
Liau-tung, Ching } ho - - -	1 20	6½		Yoku-hama, Yedo }	5 50	5	
Lau-mu ho -	1 30	5		Fatsizio - - -	6 0	5	
Tai-cho ho -	0 15	6		Port Simoda - -	5 0	3 - 5	
Yang ho - - -	0 15	6		Heda Bay - - -		5½	
Ning-hai - - -	12 0	6		Enora Bay - - -		4	
Sand Point, Gulf } of Liau-tung) -	4 50	7	5½	Simidsu - - -	7 30	7	
N.W. Head of Gulf } of Liau-tung -	5 30	10	8½	Urakami - - -	7 30	6	5
Liau Ho (Bar) -	4 0	11½	7½	Oösima - - -	6 50	5	
" (entrance) -	5 0	12		Tanabé Ki Channel	6 0	6	5½
Vansittarts Saddle	4 20	10	8½	Uranouchi " -		5	
Hulu Shan Bay -	2 30	8	6	Osaki " - -	5 55	6½	
Society Bay, Suli- } van Bay -	0 15	8		Hiogo and Corvi }	irr.	5	
Port Adams, Mary } Island -	2 0	10		Bays - - -			
Pigeon Bay -	11 45	8		Kata Channel -	6 4	6½	
Ta-lien-whan Bay	10 47	10½	8	Yura Harbour " -	6 5	6½	
Encounter Rock -	10 44	11	8	Naruto (Fukura) "	6 17	7	
Haiyun-tan } (Thornton Haven) }	9 30	12	8	Akasi - - -	6 36	6½?	
Chodo Id., Korea, } W.C. }	6 20	12		Awasima (Inland }	0 14	7	
Basil Bay " }	4 15	18	10	Sea) - - -			
Marjoribanks } Harbour " }	3 30	29		Tomo (Seto-uchi)	11 0?		5
Ko-kun-to Group " }	2 25	18	10				
Korea, S. Coast, }	9 28	11½	8½				
Kaper Harb. - }	9 50	11½	8½				
" Crichton Harb. }	8 58	11½	8½				
" S. Coast, }	9 10	11½	8½				
" Tracy Island - }	8 30	11					
" Hooper Id. -							
" Port Hamilton							
Japan Sea.				Gulf of Tartary.			
Yang-hing Bay -	5 20	2½		St. Vladimir Bay	irr.	2	
Tsaa-liang-hai or } Choson Harbour }	7 45	7	5	Napoleon Road }	2 30	2½	
(Korea - - -				(West Coast) - }	5 30	3	
Nagasaki Bay }	7 15	9	7½	Port Michael Sey-			
(Nipon, S. C.) - }				mour " - - }	10 0	3½	
Tama no Ura }		6 - 8	4 - 6	Barracouta Har-	10 30	6	
Harb., Goto Id. }				bour " - - }	10 0	6	
Ii - - -		8		Jonquiere Bay }	11 40	5 - 6	
Tsu sima Sound -	8 30	8	6	(East Coast) - }	2 0	5	
Imonoseki - -	8 30	8		Amur Strait -			
Isodo (Yebisu) -	5 0	2		Cape Maria (Sag-			
Tsugar Strait -	5 0	5		halin Id.) Sea }			
				of Okhotsk - }			
				Kamchatka.			
				Avatcha Bay -	3 30	6½	4½
				New Zealand:—South or Stewart Island.			
				Mason Bay -	11 10	8	6
				S.W. Cape -	12 0	7	5
				Port Pegasus -	11 50	8	6
				Port Adventure -	12 20	8	6
				Patersons Inlet -	1 10	8	6
				Port William -	12 45	8	6

* Time and rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
New Zealand:							
Middle Island, East and North Coasts.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bluff Harbour -	1 18	8	6	Hokianga River (entrance) -	9 45	10	
Molyneux Bay -	3 0	8	6	" (Kokohu) -	10 15	10	7
Otago Harbour (entrance) -	2 50	7	5	Cape Maria Van Diemen -	8 0	7	
Akaroa Harbour -	3 24	8	6	Three Kings Islands -	8 0	7	
Port Lyttelton, formerly Port Cooper -	3 50	7½	5½	North Island, East Coast.			
Kaikora Peninsula -	5 30	8	6	Cape Palliser -	6 0	6	
Cape Campbell -	6 0	8	6	Wairoa River -	6 45	7	4
Port Underwood -	6 10	8	6	Hawke Bay (Ahuriri Harbour) -	7 50	3	
Queen Charlotte Sound (entrance) -	8 50	8	6	Poverty Bay -	6 5	6	
Port Gore -	9 0	8	6	East Cape -	8 55	7	
Pelorus Sound (entrance) -	9 35	11	7	Hicks Bay -	9 0	7	
Port Hardy -	9 55	8	6	Tauranga Harbour -	7 10	6	4½
Croisilles Harbour -	9 0	12	8	Mercury Bay -	7 21	7	5
Nelson -	9 50	14	10	Gt. Barrier Island (Nagle Cove) -	6 25	10	7
Massacre Bay, Tasman Corner -	8 45	13	9	Auckland Harbour -	7 5	11	9
— Motu Pipi River, W. Ent. -	9 50	14	10	Kawau Island -	6 30	10	7
Cape Farewell -	9 20	14	10	Wangari Harbour -	7 0	9	7
				Tutukaka Harbour -	7 0	9	7
				Wangaruru Harbour -	7 10	9	7
				Bay of Islands, (Motu Mea Islet) -	7 15	9	6
				Wangaroa Harbour -	8 15	7	
				Cavalli Islands -	8 0	7	
				Monganui Harbour -	8 15	9	7
				Awanni River -	7 44	7	
				Parenga-renga Harbour -	7 54	7	
Middle Island, South and West Coasts.				Australia, East Coast.			
Ruapuke Id. (Fo-veaux St.) -	1 0	8	6	Twofold Bay -	10 0	7	5
Centre Id. (Fo-veaux St.) -	12 15	8	6	Botany Bay -	8 15	7 - 8	
Preservation Inlet -	11 20	8	6	Jervis Bay -	6 20	6 - 9	
Chalky Inlet -	11 5	8	6	Port Jackson, North Head -	8 15		
Dusky Bay -	11 15	10	8	Sydney -	38	4½	4
Daggs Sound -	11 30	8	6	Broken Bay -	0 0	6 - 9	
Thompson Sound -	11 30	8	6	Newcastle or Port Hunter -	9 45	6 - 7	
Bligh Sound -	10 45	8	6	Port Stephen -	9 0	6	
Milford Sound -	9 15	8	6	Manning River -	9 15	4	
Wanganui Inlet -	11 20	7	6	Crowdy Head -	9 15	5	3
				Port Macquarie -	8 56	4 - 5	
				Solitary Islands -	9 15	5	3
				Clarence River Head -	9 0	6	4½
				Danger Point -	9 30	6	4½
				Shoal Bay -	8 30		
				Richmond River -	9 20		
				Cape Byron -	9 45	6	
				Tweed River (Danger Point) -	9 45	5 - 8	
North Island, South and West Coasts.							
Port Nicholson, Lambton Harbour -	4 30	5	3				
Mana Island -	7 0	8	6				
Kapiti Island -	9 0	6					
Manawatu River -	10 0	8	6				
Wanganui River -	10 15	8	6				
New Plymouth (Taranaki) -	9 30	12	9				
Kawhia Harbour -	9 30	12					
Aotea Harbour -	10 0	12	9½				
Waikato River -	9 30	12	9				
Manukau Harbour (entrance) -	9 30	13	10				
Kaipara Harbour (entrance) -	10 55	10	8				

Place.	High Water, Full and Charge.	Rise.		Place.	High Water, Full and Charge.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Moreton Bay -	9 30	3 - 7		Darnley Island -	9 30	12	
Great Sandy Strait } (Woody Id.) - }	9 14	10	7	Bramble Cay -	9 15	12	
Sandy Cape -	7 50	6 - 8		Murray Islands -	9 30	10	
Port Curtis -	9 40	10 - 12		Adolphus Island -	12 15	10	
Byron Bay -	9 45	6		Albany Islands } (Port Albany) }	12 15	10	7
Wreck Reef, } (Bird Islet) - }	8 3	6		<i>Australia, North and North-West Coasts.</i>			
Cato Bank -	8 0	6		Endeavour Strait, } E. Entrance - }	8 10	6	
Lady Elliot Islet -	9 0	7 - 8		Booby Island -	4 30	8	
Heron Islet, } Capricorn Group }	9 0	10		Albert River -	7 30	10 - 13	3 - 8
Keppel Bay -	9 30	9 - 14		Wellesley Isles, In- } vestigator Road }	8 0	9	
Great Barrier Reef	8 48	7		Sir E. Pellew Isds.	7 30	4 - 7	
Saumarez Reef -	8 0	6		Beatrice Islet -	3 0	8	
Frederick Reef -	8 0	6		Arnhem Bay -	8 10	6	
Kenn Reef -	8 0	5½		Vanderlin Island -	9 30	7	4
Middle Bellona Reefs	8 30	6		Cape Wilberforce -	8 10	10	
Avon Isles -	8 30	5		Goulburn Isles -	6 0	5 - 6	
Chesterfield Islet -	8 30	5		East Alligator River	8 15	15	
Mellish Reef (Sand } Cay) - }	7 55	5 - 6		Adam Bay -	6 0	18	
Thirsty Scund -	10 45	12 - 18		Shoal Bay -	6 0	18 - 25	14 - 20
Port Bowen -	9 35	16		Port Essington -	3 24	13	
Shoal Water Bay -	10 30	12 - 18		St. Asaph Bay -	5 45	14	
Broad Sound -	11 0	20 - 30		Port Cockburn -	5 45	24	
Swain Reefs -	10 25	10		„ Darwin -	5 30	17 - 24	
Percy Isles, Middle } or No. 2 Island }	10 30	16	13	„ Paterson -	4 0	16 - 24	
(West Bay) -				„ Keats -	6 0	22	
„ South or }				Pearce Point -	6 55	20 - 26	
No. 1 Islet, } (N.W. Bay) - }	10 30	14		Victoria River, } Turtle Point - }	7 15	15 - 24	
West Hill -	10 20	24		„ Holdfast Reach	9 0	16	10
Cape Conway -	11 0	18		„ Mosquito Flat	0 19	7 - 13	
Goold Island -	6 45	6		„ Sandy Island	1 17	3 - 10	
Port Denison -	9 30	6		Adolphus Island -	7 30	21	
Upstart Bay -	9 0	6		Vansittart Bay -	9 15	6	
Cleveland Bay -	7 30	10 - 12		Swift Bay -	12 0	18	
Palm Isles -		8 - 10		Port Nelson -	12 0	27	
Dunk Island -	9 28	6 - 10		Prince Frederick } Harbour - }	12 0	28	
Fitz-Roy Island -	9 15	7 - 12		Careening Bay -	11 45	30	
Endeavour River -	8 0	5 - 10		Prince Regent } River, St. George }	12 20	24 - 37	
Trinity Opening, } Great Barrier } Reefs - }	9 15	7 - 12		Basin -			
Lizard Island -	9 15	7 - 10		Hanover Bay -	11 30	24 - 38	
Willis Islets -	8 0	6		Camden Harbour -	11 30	30	
Osprey Reef -	8 36	6		Montgomery Isles	12 0	36	
Flanders Group -	9 15	8 - 12		Collier Bay -	11 45	36	
Cape Sidmouth -	9 15	10		Port Usborne, } King Sound - }	1 45	34	
Cape York -	11 15	10	7	Swan Point -	0 10	28	
<i>Torres Strait.</i>				King Sound (en- } trance) - }	0 10	23	
Sir C. Hardy Is. -	9 15	10		Beagle Bay -	11 30	13 - 15	
Raine Island -	8 10	10		Carnot „ -	0 30	13 - 14	
Wallis Island -	Irreg.	7		Roebuck „ -	0 30	30	18
Cape Possession -	9 0	6		Turtle Isle (North)	11 0	18	6
Possession Island -	1 0	9½		Sandy Islet -	10 35	18	

[illegible]

* At Port Augusta, when the wind veers round to West and South and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N.; Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Fannings Id. -		4		Port Carteret, New Ireland -		6	
Pago Pago, Navigator's Ids. }		4½		Lord Howe Island	8 30	6	
Manna " -		6		Norfolk Island -	7 45	7	
Tongatabu -	6 50	4		Chatham Id., Port Hutt -	6 50	6	
Port Resolution, Tanna Island -	5 35	3		Auckland Id. Port Ross -	12 0	3	
Port Inyang, Aneiteum -	6 35	4		Campbell Island			
Banks Ids., Port Patterson, Vanu	6 40	5		South or Perseverance Harb. -	12 0	5?	3½?
Lava Id. -				Raoul or Sunday Id.	6 0	5	
" Ids., Port Sandwich, Malicollo Id. -	5 30	4		<i>Islands in North Pacific.</i>			
" Vila Harbour, Sandwich Id.	5 0	5		Karakoa Bay, Owyhee -	3 49		
" Havannah Harb. Sandwich Id. -	7 15	4		Honoruru, Sandwich Islands -	4 0	2	
" Dillon Bay, Erromango Id. -	5 30	4		Pouinipet Island, Caroline Islands }	6 0	4½	
Mboli Harbour, Florida Island, Solomon Ids. -	5 30	6		Seypan Island, (Ladrone Ids.) -	6 45	2½	
Nairai Id. Fiji Ids.	5 53	4½	3½	Pelew Islands -		6	
Matuku " -	6 18	5	3	<i>South America, Strait of Magellan.</i>			
Makongai and Wakaya Ids. " }	6 0	4	3	Cape Virgin -	8 30	36 - 42	
Ono Id. " -	6 0	4		Cape Espiritu Santo	8 30	36 - 42	
Tova or Na Vatu Reef -	6 8	4		Possession Bay -	9 0	36 - 42	
Vatua or Turtle Id.	6 11	4		Cape Orange -	3 0		
Nandi Passage and Bay -	6 35	4½		First Narrows -	9 0	36 - 42	
Erromanu or Futuna	7 24	4		Philip Bay, east side	9 30	24	
Sandalwood Bay, Fiji Islands -	6 0	6?		Gregory Bay -	9 45	23	
Port Nukulan or Rewa Road, Fiji Ids. -	6 47	5½		Second Narrows -	10 0	23	
Balade Harbour, New Caledonia	6 30	4?		Peckett Harbour -	12 0	6	
Port Alemnè, Isle of Pines, New Caledonia -	8 6	4		Laredo Bay -	11 30	9	
Prong Bay, New Caledonia -				Santa Magdalena Island -	12 0	10	
Noumea Bay, New Caledonia -	8 25	4		Port Famine -	12 0	6	
Port St. Vincent, New Caledonia	5 50	4½		Cape San Isidro -	1 0	8	
Devarenne St., New Caledonia		3½		St. Nicolas Bay -	2 6		
Port Balad " -	6 15	4½		Cape Froward -	1 0		
" Iengen " -	6 15	4½		Port San Antonio -	12 0	7	
" Uimè " -	6 48	4½		Labyrinth Islands -	0 30	5½	
Woodlark Island }	7 15	4		Port Gallant -	9 0	5½	
Eschsch Archip. }				York Road, English Reach }	2 0	9	
				Bachelor River -	1 40	5	
				Borja Bay -	1 50	7	
				Playa Parda Cove -	1 8		
				Port Tamar -	3 5	5	
				Valentine Harbour	2 0		
				Harbour of Mercy -	1 22	4	
				Cape Pillar -	1 0		
				<i>Smyth, Sarmiento, Wide, and Messier Channels.</i>			
				Goods Bay -	0 30	7	
				Fortune Bay -	0 50	7	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
Welcome Bay -	0 50	7½		<i>Chiloe Archipelago.</i>			
Puerto Bueno -	1 40	8?			h. m.	ft.	ft.
Guia Narrows -	2 10	8		Huafo Island -	12 0	7	
Fury Cove -	1 15			Cucao Bay -	12 0	6	
Eden Harbour -	12 30	5		Port San Carlos, } Town - - - }	11 15	6	
Halt Bay -	0 30	8		Port San Carlos } Pt. Arenas - }	0 14	6	
Middle Island -	12 0			" English } Bank - - - }	0 4		
<i>Tierra del Fuego, S.W. Coast.</i>				Carelmapu -	0 50	10	
Cape Horn -	4 40	9		Petucura Rock -	0 50	16	
St. Francis Bay -	4 0			San Pedro Passage	0 30	9	
St. Martin Cove -	3 50	8		Huillard Inlet -	0 48	16-20	
Middle Cove -	3 30			Quelan Cove -	0 28		
Goree Road -	4 0	8		Talcan Island -	1 3	15½	
Lennox Cove -	4 40	8		Alan Island -	0 31	18	
Nassau Bay -	4 0	6		Poqueldon Harbour	0 54	18	
Good Success Bay	4 3	6-8		Castro -	0 11	18	
Packsaddle Bay -	3 30	6		Dalcabue -	0 26		
Orange Bay -	3 30	5		Changues Islands -	0 35		
New-year Sound -	3 30			Quicavi Bluff -	0 57	20	
Adventure Cove -	3 10	4		Oscuro Cove -	0 55	20	
March Harbour -	3 10	6		Lobos Head -	0 29		
Doris Cove -	3 0	4		Compu Inlet -	1 10	17	13½
Stewart Harbour -	2 50	4		Cullin Island -		20	
Townshend Harbour	2 30	5		Huapilinao Head -	1 25	15½	
Fury Harbour -	2 30	4		Reconlavi Inlet -	0 44	14	
North Cove, Fury } Island - - }	2 30	4		Puluqui Island -	1 5		
Hewett Bay -	0 30	6½		Calbuco Fort -	1 18 or 0 47	18	
Bedford Bay -	0 30	7½		" Beach -	1 15	16	
Smyth Harbour -	12 0	6½		Abtao Island -	0 50	18	
Noir Island -	2 30	5		Tres Cruces Point-	1 15	16	
Laura Harbour -	1 0	6		Chacao Bay -	0 40	14	
Cape Castlereagh -	2 50	4		" Narrows -	1 15	16	
Cape Gloucester -	1 30	5					
Cape Inman -	2 0	4		<i>Chile.</i>			
Latitude Bay -	2 5	4		Coyhuin River -	0 52	21	
Week Islands -	2 0	5		Port Valdivia -	10 35	5	
Dislocation Harbour	1 40	4		Mocha Island -	10 30		
Diego Ramirez } Islands - - }	4 0	6		Leubu River -	10 30	5	
<i>Patagonia, West Coast.</i>				Santa Maria Island	10 20	6	
Evangelists -	1 0	5		Arauco Bay -	10 15	6	
Port Henry -	12 0	5		Talcahuano -	10 14	5	
" Barbara -	12 28	4		Maule River -	10 0	5?	
San Tadeo River -	11 45	6		Toro Point -	9 45		
Port San Domingo	12 0	7		Valparaiso	9 32	5	
Piti-Palena -	12 23	10		Juan Fernandez } Island - - }	9 30	4	
Tictoc Bay -	1 45	11		Pichidanque Bay -	9 20	5	
<i>Chonos Archipelago.</i>				Port Herradura -	9 8	5	
Port Otway -	11 37	6		Coquimbo Bay	9 8	5	
San Andres Bay -	0 45	5		Port Huasco -	8 30	6	4
Port San Estevan	0 15	5		Copiapo -	8 30	5	
Anna Pink Bay -	0 45	5		Port Flamenco -	9 10	5	
Vallenar Road -	0 18	5		Lavata Bay -	9 20	5	
Port Low -	0 40	7		Grande Point -	9 45	5	
				Paposo -	9 40	5	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Bolivia.</i>							
	h. m.	ft.	ft.		h. m.	ft.	ft.
ConstitucionCove, } Moreno - }	10 0	4		Culpepper Id. -	?	?	
Port Mexillones -	10 32	3		Wenman Isles -	2 10		
Cobija Bay -	9 54	4		<i>New Granada and Veragua.</i>			
Paquique or San } Francisco Point }	9 45			PortBuenaventura } (Negrilla Reef) }	4 0	13	
				" off the Town -	6 0	13	
				San Juan River -	6 0	12	
				Cabita Bay -	3 40	12	
				Port Utria -	4 0	12	
				Cupica Bay -	3 30	13	
				Octavia Bay -	3 30	13	
				Pinas Bay -	3 15	14	
				Chepo River -	3 40	16	
				Pedro Gonzales, } (Trapichi Id.) - }	3 50	16	
				Chamé Bay -	4 0	16	
				Saboga -	4 0	14	
				Panama Road -	3 23	15 - 22	10 - 16
				Port Nuevo -	3 10	12	
				Parida Island -	3 15	10½	
<i>Peru.</i>				<i>Central America, West Coast.</i>			
Iquiqui Road -	8 45	5		Nicoya Gulf (Port	3 9	10	
Lobo Point -	8 0			Herradura)			
Arica Road -	8 0	5		Port San Juan del }	3 8?	10?	
Ylo Road -	8 15	6		Sur - - }			
Islay -	8 53	7		Port Realejo -	3 6	11	
Quilca River -	8 0	6		Port la Union, }	3 15	10½	8½
Point Lomas -	8 19	5		G. of Fonseca - }			
Atico Road -	8 53	5		Acajutla Road -	2 25	9	
Port San Juan -	5 10	3		<i>Mexico, West Coast.</i>			
" San Nicholas	5 15	3		Port Guatulco -	1 30	5	
Independencia Bay	4 50	4		" Sacrificios -	3 15	6	
Pisco Bay -	4 50	4		Acapulco -	3 6	1½	
Callao Bay -	5 47	4		Perula Bay -		7	
Huacho Bay -	4 45	3		San Blas -	9 41	6½	
Supé Bay -	4 50	3		Mazatlan -	9 40	7	
Guarmey Bay -	6 10	2		Guaymas Harbour	8 0	4	
Samanco or }	6 30	2		<i>California and Oregon.</i>			
GuambachoBay }				San Lucas Bay -	9 20	9½	
Port Malabrigo -	5 0	2		Magdalene Bay -	7 35	6½	
Lambayeque Road	4 0	3		Port San Quentin -	9 5	9	
Port Payta -	3 20	3		Bartho- }	9 10?	7 - 9?	
Malpelo Point -	4 0	10		lomew - }			
<i>Ecuador.</i>				Playa Marie Bay -	9 20?	7 - 9?	
Sta. Clara Island -	4 0	11		Cerros Island -	9 10	7 - 9	
Morro, Sandy Point of	5 0	11		Sta. Barbara Island	8 0	3½	
Puna Island -	6 0	11		San Diego Bay *	9 38	5	3½
Guayaquil -	7 0	11		San Juan Anchor- }	9 40?	5	
St. Elena Bay -	1 18	8		age - }			
Salango Id. -	0 41	12		San Pedro Anch. *	9 45	4½	3½
Port Manta -	3 4	6		San Miguel, }	9 25	5	4
Caracas River -	3 30	10		(Cuyler Harb. *) }			
Cape Pasado -	3 30	10		San Rosa Island -	9 30?	5?	4?
Atacames Bay -	3 37	13		Santa Catalina Id.-	9 35?	5?	4?
Santiago River -	3 30	13					
Tumaca Road -	2 33	12					
Sanguanga (en- }	4 10	9					
trance) - }							
<i>Galapagos Islands.</i>							
Charles Island -	2 10	6					
Albemarle " -	2 0	6					
Chatham " -	2 23	6½					
Indefatigable " -	1 56	6					
James, I., West-end	3 10	5					
" N. side -	2 34	5					
" Adam Cove	2 14	5					
Tower Id. -	?	?					

* From the U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Santa Cruz Id. -	9 35?	5?	4?	Sturge Narrows -	6 0	12	
San Luis Obispo *	10 8	4½	3½	Rendezvous Ida. -	7 0	14	12
Monterey* -	10 22	4½	3½	Stuart Island -	6 0	12 - 14	
South Farallon* -	10 37	4½	3½	Waddington Harb., }	6 0	13	
San Francisco -				Bute Inlet -			
„ North Beach*	12 6	4½	3½	Gowlland Harb., }			
Drakes Bay* -	11 41	4½	3½	Discovery Pas-	5 30	11	
Bodega Port* -	11 17	4½	3½	sage -			
Humboldt Bay* -	12 2	5½	4½	Cameleon Harb., }	3 0	16	11½
Port Orford* -	11 26	6½	4½	Nodales Channel }	3 0	16	11½
Columbia River, }				Forward Harb., -	3 0	16	11½
Entrance - }	0 15	7½		Beaver Creek, }			
Astoria* -	0 42	7½	6	Loughborough }	3 0	16	11½
Nee-ah Harbour* -	12 33	7½	6½	Inlet - }			
Port Townshend* -	3 49	5½	5	Topaze Harbour -	3 0	16	11½
Fort Steilacoom* -	4 46	11	9½	Knox Bay -	12 0	16	
<i>Vancouver Island, Juan de Fuca Strait, and</i>				Port Neville§ -	0 30	17	12
<i>British Columbia.</i>				Port Harvey§ }	0 30	10	
Sooke Harbour -	2 0	8		(Call Creek) - }			
Esquimalt Harb.† -	irr.	7 - 10	5 - 8	Beaver Cove -		15	
Victoria Harbour†	irr.	7 - 10	5 - 8	Alert Bay, Cor-		15	
Inner Channels }				morant Id. - }			
leading from }	irr.	10 - 12		Beaver Harbour§ -	0 30	15½	11½
Juan de Fuca }				Shushartie Bay† -		12	
Strt. to Haro St. }				Bull Harbour, }	0 30	12½	
Griffin Bay, Haro }	irr.	12		Goletas Channel† }			
Archipelago - }				Blunden and Tra-			
Roche Harbour, }	irr.	12		cey Harbours, }	12 0	16	11½
Haro Strait - }				Queen Charlotte }			
Port Discovery -	2 30	7		Sound - }			
Nisqually, Puget }	6 0	18	15	Cypress Harbour, }	12 0	16	11½
Sound - }				Sharp Passage }			
Fane Id., Plum-	irr.	12		Deep Harbour, }	12 0	16	11½
per Sound - }				Fife Sound - }			
Drayton Harb., }	2 0	12		Cullen Harb. „ -	12 0	16	11½
Semiahmoo Bay }	6 30	7 - 10		Quatsino Sound, }	11 0	11	
Fraser River (entr.) }				Vancouver Id. }			
Burrard Inlet, }	6 0	16		Klaskino Inlet -	12 0	12	
G. of Georgia - }				Klaskish Inlet „ -	12 0	12	
Plumper Cove, }	noon.	12		Nasparte Inlet „ -	12 0	12	
Howe Sound† }				Ou-Ou-Kinsh }	12 0	12	
Port Graves† -	noon.	12		Inlet „ }			
Stuart Channel, }	6 0	10		Kyuquot Sd. „ -	12 0	12	
(Oyster Harb.) }				Esperanza Inlet „ -	12 0	12	
„ (Cowitchin }		10-12		Nuchatlitz Inlet „ -	12 0	12	
Harbour) - }				Nootka Sound, }	12 0	12	
Maple Bay -		12		Vancouver Id. }			
Nanaimo Harbour }	5 0	14		Hesquiat Harb. „ -	12 0	12	
G. of Georgia - }				Barclay Sound, }	12 0	12	
Nanoose Harbour, }	5 0	15		Island Harbour }			
Vancouver Id. }				Clayoquot Sound -	12 0	12	
Pander Harbour, }	6 0	18		<i>America, North West Coast.</i>			
Strt. of Georgia† }				Duncan Bay, }	12 0	21	
Port Augusta -	5 0	12		Chatham Sound }			
Hernando Island, }	6 0	12 - 14		Port Kuper -	1 40	13	10½
(Baker Passage) }				Port Simpson -	0 35	21½	14½
Strt. of Georgia }				Portland Inlet, }	1 8	16	
				(Salmon Cove) }			

* From the U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

† May to October, from Midnight to 3 a. m. November to April from Noon to 3 p. m.

‡ From observations made in the month of October.

§ From observations made in May.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sitka* -	0 34	5-7		Good-news Bay -	6 15	13½	
Behring Bay -	0 30	9		Golovnin Bay -	6 23	3½	
Port Etches -	1 15	9½		Port Clarence -	4 25		
Chalmers -	1 0	13½		Chamisso Island -	4 42		
Chatham -	1 0	12		Point Barrow -	11 45	½ - ¾	
Ounalashka Island	7 30	7½					
Cape Roshnoff -	7 30	15					

* The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation (1862), the local pilots say that the rise sometimes is as much as 16 feet.

HIGH WATER (

AT THE PLACES G

ARRAN

With the Rise of

(When a query, thus ?, is placed after the
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Place.	High Water, Full and Change.	Spring
	h. m.	
Abaco, Bahamas - -	8 0	1
Abbey Head, England -	11 10	2
Abd-ul Kuri, Indian Ocean	8 30	1
Aberdeen, Scotland - -	1 0	1
Aberdovey, Wales - -	8 0	1
Abervrach, France - -	4 14	2
Aberystwyth, Wales -	7 31	13
Abrolhos, Brazil -	3 20	6
Abtao I, Patagonia, W.C.	0 50	1
Abû-shehr, Persian Gulf	7 30	1
Acajutla, Central America	2 25	1
Acapulco, Mexico, W. Co.	3 6	1
Acheen Head, Sumatra -	8 45	1
Achillbeg, Ireland - -	5 14	1
Adam Bay, Australia, N. Coast.	6 0	1
Adams Port, (Mary Id.) Yellow Sea.	2 0	1
Adelaide Port, Australia, S. Coast.	5 44	1
Aden and adjacent Bays, Arabia, S. E. Coast.†	{ 7 30 to 9 30 }	1
Adenara, Flores, Malay Archipelago.		1
Admiralty G., Australia, N.W. Coast.	12 0	
Adolphus Id., Australia, N.W. Coast.	7 30	2
Adon Atoll, Maldives -	1 0	1
Adon Matte Atoll, Mal- dives.	3 0	1
Adventure Cove, Tierra del Fuego.	3 10	1
Port, New Zealand.	12 20	1
Sound, Falk- land Islands.	5 30	1

* By the Rise of the Tide is meant its v
† From a Survey of Aden Anchorage
according to the Surveyors of the Indian F

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Algeçiras, Spain -	1 49	4	2½	Antonio St. Port, Pata-	10 40	28	
Algoa B., Africa, S. Cst.	3 5	6¼		gonia, E. Coast.			
Alligator Rvr. Australia,	8 15	15		— St. Port, Ma-	12 0	7	
N. Coast.				gellan Strait.			
Alloa, Firth of Forth,	3 18	17½	15	Antrobus Id., G. St. Law-	10 30	5	3
Scotland.				rence.			
Altona, Germany - -	5 19	7		Antwerp, Belgium - -	4 25	15	
Amboyna, Moluccas -	0 33	7		Aor Pulo, Sumatra, N.E.		5	
Ameland Gat, Netherlands	9 0	7		Coast.			
— Hollum Rd., „	11 30	7		Aotea Harb., New Zealand	10 0	12	9½
Amet Sound, Nova Scotia	10 30	8	5	Apalachicola B., Gulf of		2¼-4	
Amiranté Isles, (St. Joseph	5 0	8½		Mexico.			
Id.) Indian Ocean.				Appetetat B., Gulf St.	11 10	5?	3?
Amwlch, Wales - -	10 30	18?	13?	Lawrence.			
Amoy (Inner Harbour),	12 0	18½	14½	Appin Port (Loch	5 26	12½	8½
China, East Coast.				Linnhe), Scotland.			
Ampanam B., Lomboek -	8 0	6		Appledore, England -	5 28	23	16½
Amsterdam, Indian O. -	11 0	3		Aquin Bay, St. Domingo	irr.	2-3?	
Amulgawein, Persian G.	11 40	6		Aracan R. (Bar), Bay of	9 45	9	6
Amur Strait, G. of Tartary	11 40	5-6		Bengal, E. Coast.			
Andaman Ids., Port Blair,	9 30	7½		Aracati, Brazil - -	6 0	8	6
Indian Ocean.				Araish El, Africa, N. Cst.	1 30	9-12	
— Port Cornwallis	10 0	8¾		Arasaig, Scotland -	5 50	13½	10
— Strait, Indian	10 24	9¼		Arauco Bay, Chile - -	10 15	6	
Ocean.				Arbroath, Scotland -	1 35	14	11
Andrava Bay, Madagas-	3 30	7		Arcachon, France - -	4 37	11½	9½
car.				Arcas Rks. G. of Mexico	noon	1½	
Andres, San B., Patagonia,	0 45	5		Ardglass, Ireland -	11 0	16	12
W. Coast.				Ardintallan, Loch Feochan,	5 31	9	6½
Andrews, St., Bay, G.	irr.	1-2		Scotland.			
of Mexico.				Ardrihaig, Loch Fyne -	11 53	9	7½
Angada, Virgin Islands	9 0	1½		Ardrossan, Scotland -	11 45	10	8
Anaiteum (Port Inyang),	6 35	4		Arenas Pt., San Carlos,	0 14	6	
S. Pacific.				Patagonia, W. Coast.			
Angoxa River, Africa, E.C.		13		Argyle, Bay of Fundy -	9 27	12½	10½
Angra, Azores - -	12 32	4½		Arica Road, Peru - -	8 0	5	
— Pequena, Africa,	2 30	8		Arichat, Nova Scotia -	8 10	5	4
S W. Coast.				Arinagour, Coll Id.,	5 39	12½	9½
Angria Bank, Hindoo-	10 30	9		Scotland, W. Coast.			
stan, W.C.				Arkhangel, White Sea -	7 28	2½	
Anna Pink B., Patagonia,	0 45	5		Arklow, Ireland - -	8 45	4	3
W. Coast.				Arnhem B., Australia, N.C.	8 10	6	
Annan Foot, England -	11 56	20	14	Arroa, Malacca Strait -		10	
Annapolis, United States	4 38	1	1	Arthur Port, Tasmania -	7 52	4	
Anne, St. B., Cape Breton	8 34	6	4½	Arundel, England -	12 25		
Annisquam, United States	11 0	10¾	9	— (Bar) - -	11 35	16	11½
Anno Bom Id., Africa	3 45	5		As Rocas, S. Atlantic -	5 15	10	
Anticosti Id., G. St. Law-				Asaph St., B., Australia,	5 45	14	
rence, East Cape -	1 0	5	3	N. Coast.			
„ Bear Bay -	1 10	5	3	Ascension Id., S. Atlantic	5 30	2	
„ West Point -	2 0	6	4	Askaig Port, Islay -	4 58	6¼	4
Antigonish Harb. R. St.	9 0	4	2	Assar Point, Hindoostan,	12 0	12	8
Lawrence.				W.C.			
Antigua Id. (English		2		Astoria, Oregon -	0 42	7½	6
Harb.), Caribbean Sea.				Atacames Bay, Ecuador	3 37	13	
Antongil Bay (Port	4 0	5		Atchafalay Bay, G. of	irr.	2-2½	
Choiseul), Madagascar.				Mexico.			
Antonio Cap: St., Cuba		1½		Athline, Loch Seaforth -	6 16	15	10
— River, Africa, E.	3 15	13	10	Atico Road, Peru - -	8 53	5	
Coast.				Auckland Harb., New Zea-	7 5	11	9
				land, N. Island.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Auckland Id., S. Pacific (Port Ross).	12 0	3		Banana Ids., Africa, W.C.	8 15	9	
Augustine St., U. States	8 21	5	4	Bankot or Sitri R., (en- trance) Hindoostan, W.	10 30	11	6
——— St., B., Mada- gascar, W. Coast.	4 30	13		Coast.			
Autezavick Sound, La- brador.		5		Banda, Moluccas -	4 0	6 $\frac{1}{2}$	
Aux Cayes Bay, St. Domingo.	irr.	2-3?		Bander Alúleh, G. of Aden	6 45	6	
Avatcha B., Kamchatka -	3 30	6 $\frac{1}{2}$	4 $\frac{1}{2}$	——— Gorí, Gulf of Aden	8 45		
Avon Isles, Australia, E.C.	8 30	5		——— Sháab, Ind. Ocean	7 0	7	
Avon River, Bigbury Bay, England.	5 47	16 $\frac{1}{2}$	11 $\frac{1}{2}$	——— Feikam, Arabia,	10 0	8 $\frac{1}{2}$	
Awasima (Inland Sea) Japan.	0 14	7		S.E. Coast.			
Awanui R., New Zealand	7 44	7		Banff, Scotland - -	0 28	10 $\frac{1}{2}$	8
Axim, Africa, W. Coast-	4 30	4		Bantam, Java - -		5	
Aylen Bay, Yellow Sea	2 30	6	4	Bantry Harb., Ireland -	3 47	10	7 $\frac{1}{2}$
Aymann, Persian Gulf -	11 20	6		Baracoa, Cuba - -	7 23	2 $\frac{1}{2}$	
Ayr, Scotland - -	11 50	8 $\frac{3}{4}$	7 $\frac{1}{2}$	Barataria Bay, Gulf of Mexico.	irr.	1 $\frac{1}{2}$	
—— Point of, I. of Man	11 7	20?	16?	Barbados, Caribbee Ids.	irr.	2	
Bab-el-Mandeb, G. of Aden	12 0	7		Barbara Port, Patagonia, W. Coast.	12 28	6	4
Bachelor River, Magellan Strait.	1 40	5		——— I. Santa, California	8 0	3 $\frac{1}{2}$	
Bacuit B., China Sea, E.C.	10 0	6		Barbe St., Sumatra, N.E.	6 0	6	
Badas Id., Linga Bay, Sumatra.*	6 0 PM	12		Coast.			
Badong B. (S. Cst.), Baly	11 0	9 $\frac{1}{2}$		——— Sta. Id., California	8 0	3 $\frac{1}{2}$	
Bagroo River, Sherbro River, Africa.			11	Barclay Sound (Island Harbour), Vancouver Island.	12 0	12	
Bahia, Brazil - -	4 15	8		——— Uchucklesit Har- bour, Vancouver Id.		12	
Bahreïn, Persian Gulf -	5 30	7		Bardsey Id., Wales -	7 40	15	
Balabac Id., China Sea, E. Coast.	11 0	5		Barfleur, France - -	8 51	17	13 $\frac{1}{2}$
Balad Harb., New Cale- donia.	6 15	4 $\frac{1}{2}$		Barmouth, Wales - -	7 41	17	13 $\frac{1}{2}$
Balambangan Id., Borneo, N. Coast.	10 0	6-8		Barnstable, United States	11 22	10	
Balasore R., B. of Bengal, W. Coast.	10 0	15		Barnstable Bar, England	5 30	19	14
Balbriggan, Ireland -	10 40	11		Barnstable Bridge, Eng- land.	6 28	10 $\frac{1}{2}$	7
Bald Head, United States	7 26	5	4 $\frac{1}{2}$	Barquero (entrance), Spain, N. Coast.	3 0	15	
Ballachulish (Loch Leven), Scotland.	5 43	11		Barra, Id. (North Har- bour), Scotland, W. C.	5 48	11 $\frac{1}{2}$	
Ballinacourty, Dungarvan, Ireland.	5 12	12 $\frac{1}{2}$	9 $\frac{1}{2}$	——— Castle Bay, Scot- land, W.C.	5 44	11 $\frac{1}{2}$	
Ballinskellig Bay, Ireland	3 40	12	7 $\frac{1}{2}$	Barracouta Harb., G. of Tartary.	10 0	3 $\frac{1}{2}$	
Ballycastle B., Ireland -	6 25	3	2	Barragan Bay, Rio de la Plata.†	7 0	5-9	
Ballycottin, Ireland -	4 54	12	9 $\frac{1}{2}$	Barren Id., China S., E. C.	9 30	5 $\frac{1}{2}$	
Ballycrovane, Kenmare River, Ireland.	3 42	10 $\frac{1}{2}$	7 $\frac{1}{2}$	Barren Ids., Madagascar	4 45	12	
Ballynakill Bay, Ireland	4 40	12 $\frac{1}{2}$	9 $\frac{1}{2}$	Barrow Harbour, New- foundland.	7 10?	5?	
Ballyness (Bar), Ireland	5 22	11 $\frac{1}{2}$	8 $\frac{1}{2}$	——— Point, Arctic Regions	11 45	4 - 3	
Ballysadare (Quay), Ireland.	6 0	8 $\frac{1}{2}$	5 $\frac{1}{2}$	Barry Id., Wales -	6 39	35 $\frac{1}{2}$	26
Ballyshannon (Bar) -	5 18	11 $\frac{1}{2}$	8 $\frac{1}{2}$	Barton Port, (Bubon Point), China Sea E.C.	10 55	6	
Ballyweel, Ireland -	5 23	12 $\frac{1}{2}$	8	Bas, Ile de, France -	4 49	23	17
Balta, Scotland - -	9 45	6	4 $\frac{1}{2}$	Básidúh, Persian Gulf -	12 0	10	
Baltimore, Ireland - -	4 23	10 $\frac{1}{2}$	8 $\frac{1}{2}$	Basil Bay, Korea, W. C.	4 15	18	10
——— United States	6 33	1 $\frac{1}{2}$	1 $\frac{1}{2}$	Basque Port, Newfound- land.	8 55	5 $\frac{1}{2}$	3
				Basrah (Bar), Persian Gulf.	12 0		

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig Saracen.

† In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Basrah Town - -	6 0?	9?		Bencoolen, Sumatra -	6 0	3-5	
Bassein R., Bay of Bengal.	10 0	9	6	Benevente, Brazil -	3 0	5	
Batanes, Bashee Islands, China Sea, E. Coast.		4		Benguela, Africa, W. Cst.	2 30	5?	
Batavia, Java - -	10 0	2		Benin R., Africa, S. Cst.	4 30	7	
Batchian, Gilolo, Moluccas	1 0	6		Benton Castle, Cleddau River, Wales.	6 23	20	14½
Bate (Gulf of Kutch), Hindoostan, W. Coast.	12 20	12	8	Berbereh or Barburra (Gulf of Aden) Africa, E. Cst.	7 15	9	
Bathurst, G. St. Lawrence	3 15	7	4	Berbice, Guayana -	4 30	11?	
Bathz, Netherlands -	3 15	15		Bergen, Norway - -	1 30	4	
Batiscan, R. St. Lawrence	9 48	3½	2	Berkeley Sound, Falkland Islands.	5 0	7	
Batoo Barra, Sumatra -	2 50	7-10		Bermudas: Ireland Id., N. Atlantic.	7 14	4	
Batticalao River, Ceylon	5 0	2-3		Bernera, Loch Roag, Lewis Id.	6 11	11	8
Bawdsey Haven (see Woodbridge Haven).				Berneray I., Sound of Harris.	6 11	13	9½
Bay of Harbours, Falk- land Islands.	6 0	5		Bersiap Point, Banka Strait.	6 30	12	
Bay of Islands, (Motu Mea Islet.) New Zealand.	7 15	9	6	Bersimis R., Gulf St. Lawrence.	2 0	12	7
Bay of Mercy, Banks Land		2		Berwick, Scotland -	2 18	15	11½
Bayonne (Bar), France -	3 45	12	10	Betcheween Harb., G. St. Lawrence.	11 32	5	3
Bazaruto Cape, Africa, E. C.	4 15	10		Beypore R. (entrance), Hindoostan, W. Cst.	12 15	4	3½
Beachy Head, England -	11 20	20	15	Bhowliaree Creek, Hin- doostan, W. C.	4 46	30	23
Beagle Bay, Australia, W. Coast.	11 30	13-15		Bias Bay (Tooniang Id.,) China E. Coast.	8 0		
Bear Cape, Prince Edward Island.	9 0	6	3	—— (Tsangchow Id.) China, E. Coast.	8 30		
Bear Head, C. Breton Id.	8 30	4½	3	Bic Id., G. St. Lawrence	2 15	14	8½
Beatrice Islet, Australia, N. Coast.	3 0	8		Biddah R., B. of Bengal, W. Cst.	10 0	14	12
Beaubère Id., Gulf St. Lawrence.	6 30	6	4	Bideford, England -	6 7	16	
Beaufort, United States -	7 26	3½	2½	Bijouga Islands, Arcas Channel, Africa, W. Cst.	10 10	11-14	9
Beaulieu, England -	{ 10 25 12 15 }	{ 10 21½ }	{ 8½ 16½ }	—— Bissao, Africa, W. Cst.	11 0	8	
Braumaris, Wales -	10 32	21½	16½	—— Orango Channel, Africa, W. Cst.	10 0	11	
Beaver Cove, Vancouver Island.		15		Bilbao (Bar), Spain -	3 0	13	
—— Creek, Loughbo- rough Inlet, B. Columbia.	3 0	16	11½	—— (Town), „ -	3 20	9	
—— Harbour, Vau- couver Island.	0 30	15¾		Biloxi, G. of Mexico -	irr.	2	
—— Nova Scotia -	7 40	6½	4½	Bima Bay, Sumbawa -	Noon.	6	
Bedeque Harbour, Prince Edward Island.	10 15	7	5	Binkang B. China Sea, W. Cst.	11 30	5	
Bedford Bay, Tierra del Fuego.	0 30	7½		Binnic, France - -	6 3	30	22½
Behring Bay, America, N. W. Cst.	0 30	9		Bintula R., China Sea, E. Cst.	5 45	6	
Belfast, Ireland - -	10 43	9½	8	Bird Island, China Sea, E. Cst.	9 30	6	
Belgrano Port, La Plata	6 0	12	10	—— Ids., Africa, S. Cst.	4 0	4-5	
Bell Sound, Spitzbergen	8 56	3½		—— Id. Light, United States.	7 59	5½	4½
Belles Amour B., Labrador	9 0	4½	2½	Blaavand Point, Jutland	1 44	5	
Belligam Bay, Ceylon -	2 20	2½		Black Ball Harb., Ireland	3 40	9½	7½
Bellona Reefs (Middle), Australia, E. Coast.	8 30	6					
Bembatooka Bay, Mada- gascar, W. Cst.	4 30	16					
Cambridge Pt., England	11 0	14	10½				
Canbecula, Scotland -	6 3	11½	8½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Black Rock, Bay of Fundy	11 29	36	31	Boughton Harb., Prince Edward Island.	8 40	5	2½
Blacksod Bay (Quay), Ireland.	4 47	10	8½	Boulogne, France -	11 25	25	19½
Blacktoft, River Humber	6 59	16		Bourbon Id., Indian Ocean, <i>sec</i> Reunion Id.			
Blair Harb., China Sea, W. Cst.	8 50	9		Bouro (Cajili Bay) Moluccas.	1 32	4½	
Blakeney, England -		9		Bow Island, S. Pacific -	2 40	3	
—— (Bar) „	6 30	15		Bowen Port, Australia, E. Cst.	9 35	16	
Blanche Port, Streaky Bay, Australia, S. Coast.	1 0	5		Bowling, R. Clyde, Scotland.	0 39	9	
Blankenberg, Belgium -	12 48	13	11	Boyanna B., Madagascar, W. Cst.	4 30	15	
Blanco Cape, Africa, W. Coast.	11 46	6		Bradore Bay, Labrador -	8 45	4	2
Blas, San, Mexico, W. Cst.	9 41	6½		Braha Harbour, Newfoundland.	7 0?	2-3?	
—— La Plata -	2 0	12	10	Bramble Cay, Torres Strt.	9 15	12	
Basket Islands, Ireland -	3 30	11½	8	Brandy Pots, River St. Lawrence.	3 0	17	10
Blewfields, Mosquito Coast	1 50	2		Brass River, Africa -	4 0	6	
Bligh Sound, New Zealand.	10 45	8	6	Brava, Africa, E. Cst. -	4 30	8	
Blind Bay, Nova Scotia	7 46	7½	6	Bray Head, Ireland -	10 45	12	9½
Block Id., United States	7 36	3½	2½	Brazos River, G. of Mexico	irr.	1½	
Bluff Cay, Bahamas -	7 0	4½		Bréhat, France -	5 51	31	23½
Bluff Harb., New Zealand	1 18	8	6	Brest, France -	3 47	19	13½
Blunden Harbour, Brit. Columbia.	12 0	16	11½	Bridgeport, United States	11 11	8	6½
Blyth, England -	3 15	15	11	Bridgewater (Bar) England	6 50	35	25½
—— R., Southwold, England.	10 20	6½	4½	Bridlington, England -	4 39	16	12
Boca de Varadero, Cuba	8 39	2		Bridport, England -	6 5	11½	7½
Bodega Port, California	11 17	4½	3½	Brielle, Netherlands -	3 0	5	
Bodkin Light, United States.	5 42	1½	1	Brig Bay, Newfoundland	9 46	5?	
Bojador Cape, Africa -	12 0	8?		Brighton, England -	11 15	19½	16
Bolt Head, England -	5 45	15?	11?	Bristol (King Road) England.	6 56	44	33
Bombay Dockyard, Hindoostan, W. Coast.	11 40	12-17		Britannia Bay, Sumbawa	1 0	11-12	
Bonacca Id., Bay of Honduras.	9 0	1½		British Sound, Madagascar, E. Cst.	4 0	9½	
Bonanza, Spain -	2 0	12½	8	Broad Sound, Australia, E. Cst.	11 0	20-30	
Bonne Esperance Harb., G. of St. Lawrence.	9 15	5	2½	Broadhaven Har., Ireland.	5 0	10½	7½
Bonny R. C., Africa, Wst.	5 0	9		Broadway R. (entrance), China, E. Coast.	11 0	7½	
Booby, Island, Australia, N. Coast.	4 30	8		Broken Bay, Australia, E. Coast.	8 0	6-9	
Bordeaux, France -	6 50	14	12½	Broom Loch (Ullapool)	6 40	14½	10½
Boria Bay, Hindoostan, W. Coast.	10 0	10	8	Broughty Ferry, Scotland	2 22	14½	11
Borja B., Magellan Strait	1 50	7		Brouwershaven, Netherlands.	2 15	10	8
Borkum (Road) Germany	10 30	8-10		Bruit River, Borneo -	3 0	11	
Boscastle, England -	5 15	25	17½	Bruni R., China Sea, E. Coast.	11 0	12	
Boston (Sluice), England	7 0	12		Brunsbüttel, Germany -	1 58	9	
—— Deep (Clay Hole) „		21½		Brunswick B., Australia, N.W. Cst.	12 0	24	
—— Hob Hole „		17		Brush, Yarmouth, England		5½	4½
—— (Charlestown Naval Yard) United States.	11 27	11½	10	Bubon Point, Port Barton, China Sea, E. Coast.	10 55	6	
—— Light, United States	11 12	11	9½	Buctouche River, G. St. Lawrence.	3 30?	4?	2½
Botany Bay, Australia, E. Cst.	8 15	7-8		Budehaven, England -	5 45	23	17
Boteler R., Madagascar -	4 30?	15?					
Boucant, France -	3 39	8½	6				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Buenaventura Port, Central America (Negrilla Reef).	4 0	13		Calcasieu Fort, Patagonia, W. Coast.	$\left\{ \begin{array}{l} 1\ 18 \\ \text{or} \\ 0\ 47 \end{array} \right.$	18	
.. off the town -	6 0	13		— River, Gulf of Mexico.		2½	1½
Buenos Ayres, S. America, E. Coast.*	12 0	3-5		Calcutta, Bengal -	2 30		
Buffalo R. (entrance), Africa, S. Cst.	3 45	4½		Caldy Island, Bristol Channel.	6 0	24?	16?
Bulama Island (Arcas Channel), Africa, W. Coast.	10 10	14	11	Calebar R., Africa, W. Cst.	5 0	9	
Bull Harbour, Goletas Channel, Vancouver Id.	0 30	12½		Caledonia Harbour, New Granada.	11 40	1½	1
Bull Id., Newfoundland	7 22	3½	2	Calf Sound, Isle of Man.	11 17	16½	13
Bulls Id. Bay, United States	7 16	5½	4½	Calicut Roads, Hindoostan, W. Coast.	12 15	4	3½
Bulls Mouth (Achill Sound, N. entrance), Ireland.	5 38	10½	7½	Callao Bay, Peru -	5 47	4	
Bulsar Khari, Hindoostan, W. Coast.	1 45	18	14½	Calshot (Castle Pt.), England.	11 30	13	9½
Buluagan O'sta Ana Port, Filipinas.	12 0	5½		Calstock, R. Tamar, England.	6 6	12½	8½
Bunawe (Loch Etive), Scotland.	7 54	5¾		Camaguin, Babuyan, Islands.	6 0	6	
Buncrana, Ireland -	5 40	16		Camariñas Port, Spain -	3 0	15	
Bunessan, Scotland -	5 24	12	8½	Cambay (town), Hindoostan, W. Coast.	5 20	day	
Burburra, see Berberch.						23	
Burin Harbour, Newfoundland.	8 45	6½	4½			night	
Burntisland, Firth of Forth, Scotland.	2 24	16½	12½	Cambing, Banda Sea, noon		6	
Burnt Isles, Kyles of Bute, Scotland.	11 50	10	8	Camden Harb., Australia, N.W. Coast.	11 30	30	
Burong I., China Sea -	4 45	7		Camelcon Harb., Nodales Channel, B. Columbia.	3 0	16	11½
Burrard Inlet, Gulf of Georgia, B. Columbia.	6 0	16		Cameroon R., Africa, W. Coast.	4 0?	6	
Barry Port, Wales -	6 1	25½	18½	Campbell Cape, New Zealand.	6 0	8	6
Basainga, Burias Island	12 30	6		— Island, South Pacific.	12 0	5?	3½?
Bushire, see Abú-shehr.				— Town, Gulf St. Lawrence.	4 0	10	7
Bussorah R. Bar, Persian Gulf.	12 0			Campbellton, Scotland -	11 45	8½	6
Button Islands, Hudson Strait.	6 50			Campeche, Yucatan -	1 45	2½	2
Byron Bay, Australia, E. Coast.	9 45	6		Campobello (Welchpool), B. of Fundy.	11 21	23½	20
— Cape, Australia, E. Coast.	9 45	6		Cancale, France -	6 20	37	27
Cabifa Bay, New Granada.	3 40	12		Canna Id., Scotland, W. Coast.	6 19	14	9½
Cacheo River, Africa, W. Coast.	7 45	8		Canso Gut (Plaister Cove), Nova Scotia.	9 10	4½	3
Cadiz, Spain -	1 45	9½		— Har., C. Breton Island.	7 48	6½	4½
Caen, France -	10 57			Cantin Cape, Africa -	10 0	10	
Caermarthen (Bar) -	6 10	26	19½	Canton River (entrance), China.	10 0	8	
Caernarvon, Wales -	9 33	13½	10½	Canton River } In Mar.	2 40	5½	
Caimites, St. Domingo -	8 0?	1?		(Kuper Id.) }			
Cairnlongh, Ireland -	10 51	5½	5	— " } In May & June	1 40	5½	
Cajeli Bay, Bouru -	1 0	6		Cape Coast Castle, Africa, W. Coast.	4 30	6	
Calais, France -	11 49	19½	15½	Cape May Landing, U.S.	8 19	6	5
Calbuco Beach, Patagonia, W. Coast.	1 15	16		Caracas River, Ecuador -	3 30	10	

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds, and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Caraquette Harbour, G. of St. Lawrence.	2 40	6	3	Catalina Harbour, Newfoundland.	7 0	6	4
Cardiff, Wales - -	6 59	38	29	Catharina Sta. I., Brazil -	2 45	6	4½
Cardigan, Wales - -	7 1	12	9	Cato Bank, Australia, E.C.	8 0	6	
—— Bay, Prince Edward Island.	8 40	5	3½	Catoche Cape, Yucatan -	9 30	1½	
Careening Bay, Australia, N. W. Coast.	11 45	30		Cattawade Bridge, Stour River, England.	1 8	4½	
Caremapu, Patagonia, W. Coast.	0 50	10		Cavalli Ids., New Zealand	8 0	7	
Cargados Garayos Shoals, Indian Ocean.	2 0	4		Cavern Island, China Sea, E. Coast.	9 30	5½	
Cargreen, R. Tamar, England.	5 47	14½	10½	Cawee Islands, Gulf St. Lawrence.	1 50	9	5
Caribou Harbour, Nova Scotia.	10 0	6	4	Cay West, United States — N.W. Channel, U.S.	9 30	1½	1½
Carleton Point, Gulf St. Lawrence.	3 0	6	4	Cayenne, Guayana -	9 10	1½	1½
Carlingford (Bar or Cranfield Point), Ireland.	11 0	14	11	Cayeux, France - -	3 45	6-11	
Carlisle Port, England -	12 10	20	14	Ceara, Brazil - -	11 5	27½	21
Carlos, San, Port, Patagonia, W. Coast.	11 15	6		Cedar Cays, United States	4 30	9	
—— (Arenas Point) Patagonia W. Coast.	0 14	6		Cedeira, Spain, N. Coast	0 51	3½	2½
—— (English Bank) Patagonia W. Coast.	0 4			Centre Id., (Foveaux St.) New Zealand.	3 0	15	
Carlos, San, Port, Falkland Islands.	7 0	8		Ceram, Wahaay Harbour, Moluccas.	12 15	8	6
Carnot Bay, Australia, W. Coast.	0 30	13-14		Cerro Id., California -	6 0	3	
Carouge River, R. St. Lawrence.	7 15	16	11	Centa, Africa, N. Coast -	9 10	7-9	
Carrigaholt, Ireland -	4 44	14	10½	Chacuchacara Id., Trinidad, Caribbean Sea.	2 6	3½	
Carsaig, Scotland -	5 28	10	7½	Chacao Bay, Patagonia, W. Coast.	3 30	4	
Cartagena, New Granada	11 0	1½	1	—— Narrows, Patagonia, W. Coast.	1 15	16	
Carteret, France -	6 25	31	22½	Chalky Inlet, New Zealand.	11 5	8	6
—— Port, New Ireland.		6		Chalmers Port, America, N. W. Coast.	1 0	13½	
Carwar or Sedashigar Bay, Hindoostan, W. Coast.	10 0	6½	5	Chamé Bay, New Granada.	4 0	16	
Cascumpeque H., Prince Edward Island.	5 40	3	2	Chamisso Id., America, N. W. Coast.	4 42		
Cashla Bay, Ireland -	4 33	16	12	Champion Bay, Australia W. Coast.	9 10	1	
Casquets, English Channel	6 45	15½		Champlain R., St. Lawrence.	9 45	3	2
Castillos, Cape, Rio de la Plata.*	8 30	2		Changchi Id., China, E.C.	9 30	17	
Castlereagh Cape, Tierra del Fuego.	2 50	4		Changues Ids., Patagonia, W. Coast.	0 35		
Castletown, Bearhaven, Ireland.	4 14	9½	7½	Chapu Road, Hang-chu Bay, China, E. Coast.	12 0	25	
—— Isle of Man -	11 10	20	16	Charles Cape, United States.	7 45	5	
Castletownsend, Ireland -	4 21	10½	8	Charles Id., Galapagos -	2 10	6	
Castors Harbour, Newfoundland.	10 50	5?		Charleston, United States	7 26	6	5
Castries B., G. of Tartary	10 30	6		Charlowka R., Lapland	8 8	12	
Castro, Patagonia, W. Cst.	0 11	18		Chateau Bay, Labrador -	7 35	3½	1
Casuarina Point, China Sea, E. Coast.	9 30	6½		Chatham, England -	1 2	17½	14
				—— Id., Galapagos	2 23	6½	
				—— (Port Hutt), S. Pacific.	6 50	6	
				—— Port, America, N. W. Coast.	1 0	12	

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Chatte Cape, United States	12 0	13	8	Clare I., Ireland -	4 38	12½	9½
Chanam Bay, China, E. Coast.	11 0	6½		Clarence Port, America, N.W. Coast	4 25		
Chausey, Isles de, France	6 9	35	26	----- Harbour, Long Island, Bahamas.	8 30	4	8½
Cheduba, Bay of Bengal-	11 30	8		----- River Heads, Australia, E. Coast.	9 0	6	4½
Chee-fow Harb., Yellow Sea, see Chifu.				Clarke Harbour, Bay of Fundy.	8 40	9½	7
Chentabun River, China Sea. W. Coast.	10 0	5½		Clayoquot Sound, Vancouver Id.	12 0	12	
Chepo River, New Granada.	3 40	16		Clear, Cape, Ireland -	4 0	9	6½
Chepstow, England -	7 30	38	28½	Clearwater Point, Gulf St. Lawrence.	11 30	5	3
Cherbaniani Reef, Laccadives, Indian Ocean.	10 0	7	4	Cleveland Bay, Australia, E. Coast.	7 30	10-12	
Cherbourg, France -	7 49	17	12½	Cley, England, N.E. Cst.		5½	
Chesilton, England -	6 13	10½	7	Clifden Bay, Ireland, W. Coast.	4 30	13½	10
Chester (Crane Wharf), England.	0 16	26		Clinch Fort, Fernandina, United States -	7 53	6½	6½
Chester River (Rockhall Creek), United States.	5 23	2½	1	Clonakilty, Bay, Ireland	10 30	11	8½
Chesterfield Islet, Australia, E. Coast.	8 30	5		Coacocho Bay, G. of St. Lawrence.	4 30	5	3
Chetican, C. Breton Id. -	8 15	3½		Cobija Bay, Bolivia -	9 54	4	
Chichester, England -	11 30	14	11	Cocagne River, G. St. Lawrence.	7 30?	4?	2?
Chifu, Yellow Sea -	10 34	8	6½	Cochin Harb. and Road, Hindoostan, W. Coast.	1 30	2½	2
Chimmo Bay, China, E. Coast.	10 20	16		Cockburn Island (Antarctic Ocean).	7 50	6	
Chimney Id., Rees Pass, China, E. Coast.	11 30	12		----- Port, Africa, E. Coast.	4 15	12	
Chin-chu Harb., China, E. Coast.	12 25	17		----- Australia, N. Coast.	5 45	24	
Chin-hae, Yung R., China, E. Coast.	11 20	12½		----- Sound, Australia, W. Coast.	9 0	1-1½	
Ching-tan Bay, Yellow Sea	6 0	12	9	Cockenzie, Firth of Forth, Scotland.	2 16	15½	13
Chipiona, Spain -	1 34	12½	8	Cod Cape, United States	11 30	13	
Chittagong (Bar), Bay of Bengal, E. Coast.	1 15	15	10	Codroy Island, Newfoundland.	9 15	6	4
Chodo Id., Korea, W. C.	6 20	12		Colorado River, La Plata	4 0	9	7½
Choisoul Port, Madagascar, E. Coast.	4 0	5		Colarados, R. La Plata -	3 40	11	
Chosan Harb. or Tsauliang-hai, Japan Sea.	7 45	7	5	Cold Spring Inlet, United States.	7 32	5½	4½
Christchurch, England -	{ 9 0 } 11 30	{ 5 } 2		Coleraine, Ireland -	6 24	6½	4
Christianstæd, Santa Cruz.	7 30	2		Collier Bay, Australia, N.W. Coast.	11 45	36	
Christmas Island, Indian Ocean.	10 0			Colne Point, Colne River, England.	12 0	14	10
Christmas Harbour, Kerguelen Id.	2 0	2		Colombilla Cay, Pearl Cays, Caribbean Sea.	2 0	2	
Chuen-pee Point, Canton River.	2 0	7½		Colombo, Ceylon -	1 0	2	
Chusan Archipelago, (Vernon Channel,) China, E. Coast.	9 40	14		Colonsay (Schallasaig) Scotland, W. Coast.	5 18	11	7½
Chusan Tinghae, China, E. Coast.	11 0	12	9	Columbia River, (entr.) America, N.W. Coast.	0 15	7½	
Circular Head, Tasmania	11 40	9		Componce River, Africa, W. Coast.	10 0	15	11½
Clam Point, B. of Fundy	8 27	8½	6½				
Clara Sta., L. Ecuador -	4 0	11					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Compu Inlet, Patagonia, W. Coast.	1 10	17	13 $\frac{3}{4}$	Croc Harbour, Newfound- land.	6 30	4 $\frac{1}{2}$	
Concarneau, France -	3 12	13	9 $\frac{1}{2}$	Croisilles Harbour, New Zealand.	9 0	12	8
Condore, Cochin China -	3 0	4		Cromarty, Scotland -	11 56	14	11
Congo River, Africa W. Coast.	4 30	6		Cromer, England -	7 0	14 $\frac{3}{4}$	11
Congoon Bay, Persian G.	7 45	9 $\frac{1}{2}$		Crow Harb., Nova Scotia	8 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
Conil, Spain - -	1 18	11 $\frac{1}{2}$	7 $\frac{1}{2}$	Crowdy Head, Australia, E. Coast.	9 15	5	3
Conquet Road, France -	3 46	21	15	Crooked Id., Bahamas -	7 0	2 $\frac{1}{2}$	
Constitucion Cove, Bolivia	10 0	4		Crookhaven, Ireland -	4 9	9 $\frac{1}{2}$	8
Conway Cape, Australia, E. Coast.	11 0	18		Cucac Bay, Patagonia, W. Coast.	12 0	6	
Cook Harb. Newfoundland	7 25			Cuckolds Point, River Thames, England.	1 45	19?	15?
Cooper Port, New Zealand.	3 50	7 $\frac{1}{2}$	5 $\frac{1}{2}$	Culdaff Bay, Ireland, W. Coast.	5 53	8 $\frac{1}{2}$	6
Copiapo, Chile - -	8 30	5		Culebra or Passage Id., Caribbean Sea.	9 0	1	
Coquet Road, England, E. Coast.	3 0	14 $\frac{1}{2}$	11	Cullen Harbour, Fife Sound, B. Columbia.	12 0	16	11 $\frac{1}{2}$
Coquimbo Bay, Chile -	9 8	5		Cullin Id., Patagonia, W. Coast.		20	
Cordouan Lthse., France	3 37	13 $\frac{1}{2}$	10 $\frac{1}{4}$	Culpepper Id., Galapagos	?	?	
Coreutyn River, Guayana	5 10	8 $\frac{1}{2}$	6	Cumberland Basin, (Sack- ville) Bay of Fundy.	11 55	45 $\frac{1}{2}$	38
Coringa or Cocanada Bay, Bay of Bengal, W. C.	9 10	4-5	3	Cumsingmun Harbour, Canton River, China.	12 6	6 $\frac{1}{2}$	
Coringa R. (Bar), Bay of Bengal, W. Coast.	9 0	5		Cupchi Point, China, E. C.	8 0		
Corisco Bay (Elobey Isles), Africa, W. Cst.	5 0	7		Cupica Bay, New Granada	3 30	13	
Cork (Penrose Quay), Ireland.	4 58	12 $\frac{1}{2}$	10	Curieuse, Seychelles, In- dian Ocean.	5 10	7	
Corn Ids., B. of Honduras	1 45	2		Curtis Port, Australia, E. C.	9 40	10-12	
Corner Inlet, S. Australia	11 40	8		Cuttyhunk, United States	7 40	4 $\frac{1}{4}$	3 $\frac{1}{2}$
Cornwall, Cape, England	4 35	18?	13?	Cutwell Harbour, New- foundland.	7 0?	2-4?	
Corpach (Loch Aber), Scotland.	5 59	11 $\frac{1}{2}$		Cuxhaven, Germany -	1 8	10	
Corran (Loch Aber), Scotland.	5 43	12	8 $\frac{1}{4}$	Cuyler Harb., California	9 25	5	4
Corunna, Spain - -	3 0	15		Cypress Harbour, Sharp Passage, B. Columbia.	12 0	16	11 $\frac{1}{2}$
Coudres Id. (Prairie Bay), R. St. Lawrence.	4 25	17	10	Daggs Sound, New Zea- land.	11 30	8	6
Courseulles, France -	9 7	20	15 $\frac{1}{2}$	Dahouet, France -	6 5	32	25 $\frac{1}{2}$
Courtmacsherry, Ireland	4 36	10 $\frac{1}{2}$	8 $\frac{1}{2}$	Dalawan Bay, China Sea, E. Coast.	11 0	5	
Coverack, England -	4 35	14 $\frac{1}{2}$	11 $\frac{1}{4}$	Dalcabue, Patagonia, W. Coast.	0 26		
Cow Head Harbour, New- foundland.	10 41	8 $\frac{1}{2}$	6 $\frac{1}{2}$	Dalhousie Harb., G. St. Lawrence.	3 10	9	
Cowes (West), England	{ 10 45 11 45 }	{ 12 $\frac{1}{2}$ 40 }	9 $\frac{1}{2}$	Dalkey Island, Ireland -	10 45	13	11
Coy Inlet, Patagonia, E. Coast.	9 30	40		Dalrymple B., Madagascar W. Coast.	5 0	15	
Coyhuin River, Chile -	0 52	21		——— Prt., Tasmania	12 5	10	7 $\frac{1}{2}$
Cozumel, B. of Honduras	8 30	1 $\frac{1}{2}$		Dampier Strait, Moluccas		11	
Crane Island, River St. Lawrence.	5 24	17	13	Danes Island, Spitzber- gen.	0 24	5 $\frac{1}{2}$	
Cranford Bay, Mulroy Bay, Ireland.	8 3	4		Danger Point, Australia, E. Coast.	9 30	6	4 $\frac{1}{2}$
Crapaud, Prince Edward Island.	10 0	8	6	Darnley Id., Torres Strait	9 30	12	
Crichton Harbour, Korea, S. Coast.	9 50	11 $\frac{1}{2}$	8 $\frac{1}{4}$	Dartmouth, England . -	6 16	14 $\frac{1}{4}$	10 $\frac{1}{2}$
Crimon Ids., Java Sea -	8 0	6	5				
Crinan, Scotland -	4 49	6 $\frac{1}{2}$	5				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Darwin H., Choisenl Sd., Falkland Islands.	6 30	5½		Dilhi or Dielli, Timor -	1 0	6	
Darwin Port, Australia, N. Coast.	5 30	17-24		Dillon Bay, Erromango Id., Banks Ids.	5 30	4	
Dauphin Fort, Madagascar	4 30	7		Dingle, Ireland -	3 51	10½	7½
De Roompot, North Sea	12 30	12	8	Discovery Port, America, N. W. Coast.	2 30	7	
Deal, England -	11 15	16	12½	Dislocation Harb., Tierra del Fuego.	1 40	4	
Dealy Id., Melville Id. -	1 48	4		Diu Harb., Hindoostan, W. Coast.	11 0	6	4½
Deep Harbour, Fife Sound, B. Columbia.	12 0	16	11½	Dives, France -	9 39	21	16
— Point, Durian Strait	5 0	10		Divy Pt., Bay of Bengal		5	
Deer Sound, Orkneys -	10 30	10	7½	Doboy Lighthouse, U. S.	7 33	7½	7
Delagoa Bay (Port Mel- ville), Africa, S. Coast.	4 30	15		Dodandowe Bay, Ceylon	1 50	1½	
Delagoa Bay (Portu- guese Factory), Africa, S. Coast.	5 20	12		Dodo River, Bight of Benin.	4 17	5	
— Shefeen Id., Africa, S. Coast.	4 40	12		Domingo, San, Port, Pa- tagonia, W. Coast.	12 0	7	
Delaware (Breakwater), United States.	8 0	4½	3½	Donaghadee, Ireland -	11 13	11½	9
Delfstryl, Germany -	11 15	8-10		Donegal Harb., Ireland -	5 18	11½	8½
Delgado C., Africa, E. C.	4 0	16	11½	Doris Cove, Tierra del Fuego.	3 0	4	
Demerara R., Guayana -	4 45	9	6	Dornock Road, Scotland	11 47	11	
Denham Sound, Sharks Bay, Australia, N.W. Coast.	12 5	5		Douany, Comoro Ids.	4 0	11-12	
Denial Bay, Australia, S. Coast.	12 15	6		Douglas, Isle of Man -	11 12	20½	16
Denison Port, Australia, E. Coast.	9 30	6		— Road, Bahamas -	8 30	4	2½
Deoghur Harbour (en- trance), Hindoostan, W. Coast.	11 0	9	7	Dover, England -	11 12	18½	15
Depuch Isle, Australia, W. Coast.	10 40	14		Downham Reach, Orwell, England.	12 27	12	
Desire Port, Patagonia, E. Coast.	12 10	18½		Dragons Mouth, Carib- bean Sea.	3 0	4	
Devarenne Strait, New Caledonia.		3½		Drakes Bay, California -	11 41	4½	3½
Devonport Dockyard, England.	5 43	15½	11½	Drayton Harb., St. Juan de Fuca Strait.	2 0	12	
Dhardur R. (entrance), Hindoostan, W. Coast.	4 30	27	20-22	Drogheda (Bar), Ireland	11 0	11½	9
Dheli River, Sumatra -	3 0	8		Duart, Isle of Mull -	5 0	12	10
Diamond Island, Bay of Bengal.	10 30	8		Dubba River, Hindoo- stan, W. Coast.	10 10	8	
— Point, Malacca Strait.	12 0	9½		Dublin (Bar), Ireland -	11 12	12-14	9-11
Diego, San, Bay, Cali- fornia.	9 38	5	3½	Dumbarton, Scotland -	0 20	9	
Diego, San, Cape, Tierra del Fuego.	4 30	10		Dunbar, Scotland -	2 8	14½	11
— Garcia Island, Indian Ocean.	1 30	6		Dunbeacon, Ireland -	3 51	10½	7½
— Ramirez Ids., Tierra del Fuego.	4 0	6		Duncan Bay, N.W. Coast of America.	12 0	21	
Dielette, France -	6 40	27	20½	Duncansby Ness, Scot- land.	10 14	8½	6
Lieppe, France -	11 6	27	20½	Dundalk, Ireland -	10 56	13½	11½
Ligby Gut, B. of Fundy	11 0	27½	23	Dundee, Scotland -	2 32	14½	11½
				Dungeness, England -	10 45	21½	19
				Dunk Island, Australia, E. Coast.	9 28	6-10	
				Dunkerque, France -	12 8	16½	13½
				Dunkerron, Kenmare R., Ireland.	3 45	10½	8
				Dunmanus Harb., Ireland	3 57	9½	7½
				Dunmore, Ireland -	5 27	12½	9½
				Durnford Port, Africa, E. Coast.	4 45	12	
				Dusky Bay, New Zealand	11 15	10	8
				Dvina (Bar), White Sea		3½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Dyer Id., Africa, S. Cst.	2 50	5		Erronau or Futuna, S. Pacific.	7 24	4	
Easdale Sound, Scotland	5 10	10-12		Escumenac, Pt., Gulf St. Lawrence.	4 10	4	2½
Easter Id., South Pacific	2 0			Esperanza Inlet, Vancouver Id.	12 0	12	
East Cape, New Zealand	8 55	7		Espirito Bay, Brazil -	3 0	4	
—Point, Prince Edward Island.	8 30	3½	2	Espiritu Santo, C., Magellan Strait.	8 30	36-42	
—Alligator River, Australia, N. Coast.	8 15	15		Esquimalt, St. Juan de Fuca Strait.*	irr.	7-10	5-8
Eclipse Harbour, Labrador.		5		Essington Port, Australia, N. Coast.	3 24	13	
Ecrehous, France -	6 32	31	22½	Estevan, San, Port, Patagonia, W. Coast.	0 15	5	
Eddystone Pt., Australia, E. Coast.	9 39	7		Etches Port, America, N.W. Coast.	1 15	9½	
Eden Harbour, Patagonia, W. Coast.	12 30	5		Evangelists, Patagonia, W. Coast.	1 0	5	
Edgar Port Falkland Is.	7 15	6		Exmouth, England -	6 21	12½	8½
Edgartown, United States	12 16	2½	2	Exuma, Bahamas -	7 20	2½	
Edina, Africa, W. Coast	5 50	4		Eyemouth, Scotland -	2 15	15½	11½
Edmonstone, Id., Sherbro River, Africa.			8	Eyre Port, Australia S. C.	10 30	6	
Egg Id. Lt., United States	9 4	7	5½	Fair Isle, Shetlands -	11 0	5	3½
— G. St. Lawrence	2 0	11	6	Fairy Port, Australia, S.C.		4	
Egmont Bay, Prince Edward Island.	8 0	4	2	Falkland Sound (N. entrance), Falkland Id.	6 45		
— Port, Falkland Islands.	7 30	11		— (S. entrance)	7 0		
Eides Fiord, Færoe Ids.	11 0	9½	7½	Fall Harbour, Labrador -	6 40	3½	
Eigg Id., Scotland -	6 15	14	10	Falmouth, England -	4 57	16	12
Elbe, Entrance, Germany	12 0	11		False Point, Bay of Bengal, W. Coast.	8 0	8	
Elena Sta., Port, Patagonia, E. Coast.	4 0	17		Famine Port, Magellan Strait.	12 0	6	
— Bay, Ecuador -	1 18	8		Fane Id., Plumper Sound, Oregon.	irr.	12	
Elizabeth Bay, Africa, S. W. Coast.		5-6		Fannings Id., S. Pacific -		4	
Ellen Port, Islay -	5 0	5	4	Fanny Hole, Mulroy Bay, Ireland.	6 17	9½	6
Ellenwoods Anchorage, Bay of Fundy.	9 54	13	10½	Fansiak Channel, Canton R., China, E. Coast	1 0	7½	5
Elliot Port, Australia, S.C.		5-6		Farallon, South, California	10 37	4½	3½
Emden, Germany -	12 0			Fareham (close to the Upper Quay), England.	11 48	11½	8½
Ems River, (outer buoy), Germany.	10 0	8-10		— Bridge, England.	11 51	7½	4½
Encounter Rock, Yellow Sea.	10 44	11	8	Farewell, Cape, New Zealand.	9 20	14	10
Endeavour R., Australia, N. Coast.	8 0	5-10		Fatsizio, Japan Sea -	6 0	5	
— Strait, Australia N. Coast.	1 0	9½		Fayal, Azores, Atlantic Ocean.	11 45	4	
Endermo Harbour, Japan	5 30	6		Fear, Cape, River, United States.	7 19	5½	4½
English Bank, San Carlos, Patagonia, W. Coast.	0 4			Fécamp, France -	10 44	23½	16
English Harbour, Antigua		2		Fénérine, Madagascar -		3½	
English R., Delagoa Bay, Africa, S. Coast.	7 30	5		Fenit, Tralee Bay, Ireland	4 3	12½	9½
Enora Bay, Japan Sea -		4		Feolin Ferry, Jura -	4 41	6½	4½
Eran Bay, (Palawan) China Sea, E. Coast.	10 10	6½		Fernandina, Clinch Fort, United States.	7 53	6½	6½
Erebus Bay, Barrow Strt.	12 6	8		Fernando Noronha Island, S. Atlantic.	4 0	6	
Erme River, Bigbury Bay, England.	5 40	16½	11½				
Erqui, France - -	5 59	33½	24½				

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Fernando Po, Bight of Biafra.	4 0	7		Foynes Island, Ireland -	5 35	15½	12
Ferrole Cove, New, Newfoundland.	10 50	5?		France, Port de, or Noumea Bay, N. Caledonia.	8 25	4	
— Harb., Old, "	9 28	4½-6½		Francis, St., Bay, Tierra del Fuego.	4 0		
Ferribly Sluice, River Humber.	6 41	20½		Francisco, San (North Beach), California.	12 6	4½	3½
Ferro, Canary Ids. -	12 30?	9?		Fraser River (entrance), British Columbia.	6 30	7-10	
Ferrol, Spain -	3 0	15		Fraserburgh, Scotland -	0 40	11	8½
Ferry Side, South Wales	5 49	23	16½	Frechette Id., River St. Lawrence.	8 0	14	9
Filey Bay, England -	4 20	16	12½	Frederick Reef, Australia, E. Coast.	8 0	6	
Finisterre, Cape, Spain -	3 0			Frederickshaab, Greenland.	6 3	12½	9½
Fish Hd., G. Manan, Bay of Fundy.	11 16	22½	18½	Freycinet Estuary -	4 15	3½	
Fishguard, Wales -	6 56	11½	8½	— Reach, Sharks Bay, Australia N.W. Coast.	3 0	5	
Fitz-Roy Id., Australia, E. Coast.	9 15	7-12		Friederichstadt, Denmark	2 37	9	
Fitzroy Port, Falkland I.	4 45	6		Frio Porto, Brazil -	2 40	4½	
Flamand Bay, St. Domingo	irr.	2-3?		Froward Cape, Magellan Strait.	1 0		
Flamborough Hd., England	4 30	16	12	Fugloe Fiord, Faroe Ids.	11 15	6½	4½
Flamenco Port, Chile -	9 10	5		Funchal Bay, Madeira -	12 48	7	
Flatholm Ids., Bristol Channel.	6 54	37?	28?	Funk Id., Newfoundland	7 0?	2-3?	
Fleetwood Port, England	11 12	26½	19½	Fury Cove, Patagonia, W.C.	1 15		
— Wyre Light -	11 11	27	20½	— Harbour, Tierra del Fuego.	2 30	4	
Flesh Bay, or Bay St. Braas, Africa, S. Coast.	8 30?	6?		Fury Id., Tierra del Fuego	2 30	4	
Fleur-de-lis Harb., Newfoundland.	7 15	2-4		Fury and Hecla Strait, Arctic Regions.	7 0	8	
Flinders Group, Australia, E. Coast.	9 15	8-12		Gaboon R., Africa, W.C.	5 30	3	
Florida Cape, United States.	8 36	1½	1½	Gallant Port, Magellan Str.	9 0	5½	
Flushing, Belgium -	1 20	15		Galle, Pointe de, Ceylon, S. Coast.	2 0	2	
Fox Ids., Hang-chu B., China, E. Coast.	11 45	17		Gallegos Port, Patagonia, E. Coast.	8 50	46	
Fogo Id., Newfoundland	7 20	4		Gallinas R., Africa, W. C.	6 45	4	
Folkstone, England -	11 7	20	16½	Galloway (Mull of) -	11 15	15?	12?
Folly Point, Petitcoudiac River, B. of Fundy.	11 49	45	38	Galong Bay, Hainan Id., China Sea.		4-5	
Fongwhang Group (Bullock Harb.) China W.C.	8 30	17		Galveston, G. of Mexico		1½	½
Forgados River, Bight of Benin.	4 22	5		Galway, Ireland -	4 35	14½	11
Fore carraeh R., Africa, W.C.	7 40	11		Gambia R., Africa, W.C.	8 10	6-9	
Forbury Point, England -	10 35	28		Gambier Ids., Australia, S. Coast.	1 50	3	
Formosa Mt., Malacca Str.	8 0	11	8½	Garliestown, Scotland, W. Coast.		17	12
Fort Dauphin, St. Domingo	7 0	5½	3½	Garroch Head -	11 49	10	
Fortune Bay, Patagonia, W. Coast.	0 50	7		Gaspé Basin, Gulf St. Lawrence.	2 40	5	3
Forward Harb., British Columbia.	3 0	16	11½	Gay Head, United States	7 37	7	
Foulness, Crouch River, England.	12 5	14½	10½	Geby, Fohou Id., Gilolo Passage, Moluccas.		5	
Fowey, England -	5 14	15	11½	Geelong Harbour, Australia, S. Coast.	2 30	3½	2½
Fowlers B., Australia, S.C.	10 30	6		George Cape, Nova Scotia	9 15	4	2
Fox Bay, Falkland Ids. -	7 0	6		George d'Elmina, St. Africa, W. Coast.	4 30	6	
Foye Lough (Warrenpoint), Ireland.	6 20	6½	5				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
George Port, B. of Fundy	11 17	32	28	Good Hope, Cape of, China, E. Coast.	9 0		
— St., Basin, Australia, N. W. Coast.	12 20	24-37		Good News, B. America, N. W. Coast.	6 15	18½	
— Shoals, United States.	10 30	7		Good Success Bay, Tierra del Fuego.	4 3	6-8	
— St., Harb., Newfoundland.	10 3	6½	4½	Goold Island, Australia, E. Coast.	6 45	6	
Georges Bay, Tasmania	9 42	3	2	Goole, River Humber, England.	7 26	13	
Georges, St., Sound, G. of Mexico, middle entrance.	1 31	1½	1½	Gooria Creek (entrance), Hindoostan, W. Coast.	11 0	8½	
— west entrance	irr.	2½-4		Goose Cove, Newfoundland.	7 0?	2-3?	
Georgetown, United States	8 40	4½	3½	Gorda Sound, Virgin Islands.	8 30	1½	
— South Island, United States.	7 56	4½	3½	Gore Port, New Zealand	9 0	8	6
Geriah or Viziadroog, Hindoostan, W. Coast.	11 0	9	7	Gorée, Africa, W. Coast	7 45	2½	
Germain St., France -	6 20	34	25	Goree Road, Tierra del Fuego.	4 0	8	
Ghubbet Ne, Socotra, Indian Ocean.	7 0	7		Goulburn Ids., Australia, N. Coast.	6 0		
— Hashish, Arabia, S.E. Coast.	10 0	10		Goury, France - -	7 6	22	17½
Gibraltar (old Mole) Spain.	2 20	3½		Gowlland Harbour, Discovery Passage, Vancouver Id.	5 30	11	
Gigha Sound, Scotland -	2 22	4	2½	Gracias, Cape, Harbour, Bay of Honduras.	10 30	2	
Gijon Bay, Spain, N. Cst.	8 0	14	11	Grand Cestos, Africa, W. Coast.	5 20	4	
Gilmorris Id., Africa, W. Coast.	6 0	11		— Harb., Gd. Manan, Bay of Fundy.	11 7	21	17½
Gizri River, Hindoostan, W. Coast.	9 45	10		Grand Lahou, Africa, W. Coast.	4 20	4	
Glasgow, Scotland - -	1 25	9	7½	Grand Passage, B. of Fundy.	10 43	20½	17
— Port, Scotland -	0 18	9		Grand Port, Mauritius -	1 0	1½	
Glenan Iles, France -	3 12	13	10	— Rustico, Prince Edward Island.	6 40	4	2
Glennie Ids., Bass Strait	12 20			Grande-digue, Madame I., Cape Breton Id.	7 55	6½	4½
Gloucester Cape, Tierra del Fuego.	1 30	5		Grande Point, Chile -	9 45	5	
— Harbour, United States.	11 4	10½	8½	Granton Pier, Scotland -	2 20	16	12½
Gluckstadt, Germany -	3 9	10		Granville, France -	6 13	37	27½
Goa Bay, Hindoostan, W. Coast.	10 30	7	5½	Gravelines, France -	12 0	19	15
Goapnath Point, Hindoostan, W.C.	2 25	18	13½	Graves Port, Howe Sound, Gulf of Georgia,* British Columbia.	noon	12	
Godbout River, Gulf St. Lawrence.	1 52	11	6	Gravesend, England -	1 10	17½	14
Goeree (West Gat) -	1 45	7		Great Barrier, Id. (Nagle Cove), New Zealand.	6 25	10	7
Gogah, Hindoostan, W. Coast.	3 50	27-30	21	Great Barrier Reef, Australia, E. Coast.	8 48	7	
Gollonsir Socotra, Ind. Ocean.	7 20	8		Great Fish Bay, Africa, W. Coast.	2 30	5-6?	
Golovnin Bay, America, N. W. Coast.	6 23	3½		Great St. Lawrence Harb., Newfoundland.	8 30	7	4
Gomera, Canary Ids. -	12 45?	9?		Greatman Bay, Ireland	4 39	15½	11½
Gometra, Loch Tuadh, I. of Mull.	5 29	11½	8	Green Island, River, St. Lawrence.	2 45	16	5½
Gonaives Bay, St. Domingo	8 0	1					
Good Bay, Newfoundland.	10 40	7½	5½				
Goods Bay, Patagonia, W. Coast.	0 30	7					

* From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Greencastle Point, Ireland.	11 2	14	11½	Halifax, Nova Scotia -	7 49	6	5
Greenock, Scotland -	12 8	9½	8½	Halt Bay, Patagonia, W. Coast.	0 30	8	
Greenwich, England -	1 43	19	15	Hamburg, Germany -	5 29	6½	
Gregory Bay, Magellan Strait.	9 45	23		Hamilton Port (Korea), Yellow Sea.	8 30	11	
— Port, Australia, W. Coast.	11 30	8		Hammelin Pool, Sharks Bay, Australia, N.W. Coast.	5 0	3½	
Grenada (St. George Harb.), Caribbee Ida.	2 40	1½	¾	Hammerfest, Norway -	1 10	9	
Grenadines, Caribbee Ids	3 0	1½	1	Hammond Knoll, England, E. Coast.	7 40		
Grey Port, Swan River, Australia, W. Coast.	9 0	1-1½		Han-kau, China, W. Coast		33-38	
Groetown, Mosquito Cst.	9 0	1½		Hang-chu Bay (Seshan Ids.), China, E. Coast.	11 45	14	
Grobanika Pt. White Sea	4 50	3		— (Fog Ids.) -	11 45	17	
Großen Bay, Haro Archipelago.	irr.	12		— (Chapoo Rd.)	12 0	25	
Griffith I., Barrow Strait	12 15	3½	2½	— off Can-pu -		32	
Grignat Bays, Newfoundland.	7 0?	2-3?		Hanover Bay, Australia, N.W. Coast.	11 30	24-38	
Grimsby, England -	5 36	19½	15	— Sound, Bahamas	8 15	4	3
Grindstone Island, Bay of Fundy.	11 47	41	34½	Hanstul (mouth), Gulf of Kutch, Hindoostan.	2 0		
Grisaez Cape, France -	11 27	21½	16½	Harbour of Mercy, Magellan Strait.	1 22	4	
Grundine, R. St. Lawrence	9 0	9	6	Harbour Grace, Newfoundland.	7 30?	7?	
Gumbacho Bay, Peru -	6 30	2		Harbour Id., Nova Scotia	7 40	6½	4½
Guardafui Cape, Africa, E. Coast.	6 15	6		Hardy Port, New Zealand	9 55	8	6
Gurmei Bay, Peru -	6 10	2		Haro Strait (Channels leading to, from St. Juan de Fuca Strait).	irr.	10-12	
Guatulo, Mexico, W. C.	1 30	5		Harrington Port, England	11 5	26	19
Guayaquil, Ecuador -	7 0	11		Hartlepool, England -	3 28	15	11½
Guaymas, Mexico, W. C.	8 0	4		Harvey Prt. (Call Creek), Vancouver Id.	0 30	10	
Guernsey, (St. Peter Port,) English Channel.	6 37	26	18½	Harwich, England -	12 6	11½	9½
Guisa Narrows, Patagonia, W. Coast.	2 10			Hastings, England -	10 53	24	17½
Guinchoes Kay, Bahamas	7 40	3		— Harbour, Bay of Bengal, E. Coast.	10 40	13½	
Guin Cay, Bahamas -	8 30	3		Hatiling Bay, Moluccas -	6 0	3-4	
Guindavi R. (entrance), Hindoostan, W. Coast.	2 0	19	15½	Hatteras Inlet, United S.	7 4	2½	2
Gumfleet Sand, England -	11 40	12	8	Haute Isle, Bay of Fundy	11 21	33	28½
Gutzlaff Id., China, E. C.	11 30	15		Havana, Cuba -	8 14	3	
Guyborough, Nova Scotia.	8 20	6½	4½	Havannah Harb., Sandwich Id., Banks Ids.	7 15	4	
Heedore (Banbeg), Ireland.	5 32	11	8	Haverfordwest, Wales -	6 42	7½	2½
Harlem, Netherlands -	9 0			Håvre, France -	9 51	22	18
Habitat Id., Lapland -	7 9	9		Hawke B., New Zealand	7 50	3	
Habitants Harb., C. Breton, Id.	8 20	6½	4½	Hearts Content, Newfoundland.	7 30	4	2½
Haimun Bay, China, E. Coast.	9 0			Héaux Lights, France -	5 45	31	23½
Hiti Cape, St. Domingo	6 0	3		Heawandou Pholo Atoll, Maldives.	9 30	5	
Hiyun-tan, (Thornton Haven), Yellow Sea.	9 30	12	8	Heda Bay, Japan Sea -		5½	
Hiamri River, Hindoostan, W. Coast.	9 40	8		Helena St., Bay, Africa, W. Coast.	2 30		
Hakluyt Head, Nova Zembla.	1 30	4		— Id., S. Atlantic	3 11	3	
Hakodadi Harb., Yezo Island, Japan.	5 0	3		— St. Sound, U.S.	7 8	7½	6
				Helford, England -	4 43	15½	11½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Helgoland, German Ocean	11 33	9½	7	Holsteinborg, Greenland	6 30	10	
Helier, St., Jersey, English Channel.	6 36	31½	23	Holy Island, England -	2 30	15	11½
Hell Gate Approaches, United States.				Holyhead, Wales -	10 11	16	12½
----- Long Id., (Blackwells Dock).	9 59	6	5½	Hon-cohe Bay, China Sea, W. Coast.	11 30	5	
----- N. of Astoria Ferry.	9 48	6½	5½	Hondenklip Bay, Africa, S.W. Coast.	2 30	5½	
----- Pot Cove, (S.E. part).	10 48	8½	6½	Honfleur, France -	9 29	23½	18
----- Wards Id., (Paupers Dock).	10 9	6½	5	Honghai B., China, E. C.	10 0	6½	
Hellevoetuis, Netherlands.	2 30	8	6	Honoruru, Sandwich Ids.	4 0	2	
Henlopen Cape, United States.	8 0	4½		Hongkong, China, E. C.	10 15	4½	
Henry Cape, United States	7 40	4		Hoogly R., (W. entrance), Bay of Bengal, W.C.	10 0	10½	
Henry Port, Patagonia, W. Coast.	12 0	5		Hooper Island, Korea, S. Coast.	9 10	11½	8½
Hernando Id., Strait of Georgia, B. Columbia.	6 0	12-14		Hope Harb., Falkland Ids.	8 10	7	
Hermite Isle, Australia, W. Coast.	10 0	14		----- Sound (Mia-u-tau Group), Yellow Sea.	10 24	6½	
Heron Islet, Capricorn Group, Australia, E. C.	9 0	10		Horn Cape, Tierra del Fuego.	4 40	9	
Herradura Port, Chile -	9 8	5		Horn or Blaavand Point, Jutland.	1 44	5	
----- Nicoya Gulf -	3 9	10		Horton Bluff, B. of Fundy	12 30	48	40
Hesquiat Harbour, Vancouver Id.	12 0	12		Hougue La, France -	8 42	18½	14½
Hewett Bay, Tierra del Fuego.	0 30	6½		Hourdel, France -	11 26	27½	21
Heybridge, Blackwater, River, England.	12 20	12	8	Hout B., Africa, W. Cst.	2 20	5	
Hie-chechin Bay, China, E. Coast.	7 0			Houtman Rocks, Australia, W. Coast.	11 30	2½	
Hicks Bay, New Zealand	9 0	7		Howden, R. Tyne, England.		12	
Hierting, Jutland -	2 45	5		Howe, West Cape, Australia, S. Coast.	9 0	6	
Higbees, Cape May, United States.	8 33	6½	5½	Howth Harbour, Ireland	11 9	13	10
Hillsborough R., Charlottetown, Prince Edward Id.	10 45	9½	8	Huacho Bay, Peru -	4 45	3	
----- (Head of R.)	11 0	10	7	Huafo Islands Patagonia, W. Coast.	12 0	7	
----- Island (New Port), Bonin Islands.	11 32	3½		Huapilinao Hd., Patagonia, W. Coast.	1 25	15½	
Hillswick Firth, Shetland	9 45	6½	5	Huasco Port, Chile -	8 30	6	4
Hilton Head, United States	7 19	7½	6½	Hui-ling-san, China, S. Coast.	8 15	7½	
Hiogo Bay, Japan Sea -	irr.	5		Huilead Inlet, Patagonia, W. Coast.	0 48	16-20	
Hirtshals, Jutland -	4 28	1		Hu-i-tau Bay, China, E. Coast.	12 15	16	
Hobarton, Tasmania -	8 15	4½	3½	Hull, England - -	6 29	20½	16½
Hoe-e-tow Bay, China, E. Coast.	12 15	16		----- Bridge, Crouch R., England.	12 25	16	11
Hokianga R. (entrance), New Zealand.	9 45	10		Hulu Shan B., Yellow Sea	2 30	8	6
Hokianga R. (Kokohu) New Zealand.	10 15	10	7	Humboldt Bay, California	12 2	5½	4½
Hollesley, England -	11 30	8?	6?	Hunter Id., Bass Strait -	11 30	8	
Holmes Hole, United States.	11 43	1½	1½	Hunter Port, Australia, E. Coast.	9 45	6-7	
				Hurst (Camber), England	{ 10 0 } { 12 0 }	{ 7½ }	6
				Husum, Denmark -	2 36	9	
				Hyannis, United States -	12 22	4	3
				Ichabo Id., Africa, W. C.	1 0	6	4
				Iengen, New Caledonia -	6 15	4½	
				Ilfracombe, England -	5 42	27½	21½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Iki, Japan Sea - -		8		Jerba, Mediterranean -	3 10	7	5
Ilha Grande, Brazil -	12 30	5	4	Jericoacoara, Brazil -	11 30	12	9
Ilho, Port d', Africa, W. Coast.	3 0	8-10		Jersey (St. Helier), English Channel.	6 36	31½	23
Iloilo Port, Filipinas -	12 0	5½		— (Rosel) -	6 15	30	21½
Inagua, Bahamas -	8 0	3½	2½	Jervis Bay, Australia, E. Coast.	6 20	6-9	
Indefatigable Id., Galapagos.	1 56	6		Jezirat Arabi, Persian G.	6 30?		
Independencia Bay, Peru	4 50	4		— Hamar-al-nafur,	9 30	10	
Indian Cay, Florida -	8 23	2½	1½	— Arabia, S.E. Coast.			
Indus (Gizree Bunder), Hindoostan, W. Coast.	9 50	7		— Jún Persian Gulf	11 30	10	
Inhambane R., Africa, E.C.	4 15	10		— Kabr " -		8½	
Inishbofin, Ireland -	4 34	12½	9½	— Kais " -	0 45	7½	
Inishkeel, Ireland -	5 10	11	8	— Kharg or Káreg " -	8 0	6½	
Inishturk, Ireland -	4 36	12½	9½	— Larek " -	10 15		
Inkanskie, White Sea -	9 15	14		— Tumb " -		8	
Inman Cape, Tierra del Fuego.	2 0	4		Jiddah, Red Sea - -		3	
Intsi Point, White Sea -	11 55	16		Jijginsk Island, White Sea.	5 15	4	
Inverary, Scotland -	12 0	10		Joao San, Brazil -	6 24	14	10½
Inverness, Scotland -	12 18	12	9½	Johanna Id., (anchorage)	3 40	11	
Investigator Rd., Australia, N. Coast.	8 0	9		— Pomony Harb., Comoro Ids.	4 0	11	9
Iona Sound, Scotland -	5 11	11½	8½	John St., Bay of Fundy -	11 21	27	23
Ipswich, England -	12 35	13½		— Newfoundland -	7 30	6	4
— United States -	11 26	10½	8½	(East Coast).			
Iquiqui Road, Peru -	8 45	5		— (North Coast) -	10 40	7½	5½
Ireland Id., Bermudas -	7 4	4		— River, Africa, S. Coast.	4 0	5	
Isidro St., Cape, Magellan Strait	1 0	8		— River, U. S. -	7 28	5½	5
Island Harbour, Choiseul Id., Falkland Islands.	5 20	6		Jonquiere Bay, Gulf of Tartary.	10 0	6	
Islay, Peru - -	8 53	7		Joombas R., Africa, W.C.	8 10	6	
Isle-aux-Coudres, R. St. Lawrence.	4 25	17	10	Josef, San, Port, Patagonia, E. Coast.	10 0	30	25
Isles de Los, Africa, W. C.	6 35	13		Jourimain Island, New Brunswick.	9 30	6	3
Isolette Cape, Arabia, S.E. Coast.	9 0	10		Juan de Nova, Madagascar		5	
Ives, St., England -	4 44	21	15	Juan Fernandez I., Chile	9 30	4	
Jacinto, Port San, Ticao Id. Filipinas.	6 30	6		Juan San, Porto Rico -	8 2	1½	
Jackson Port (N. Head), Australia.	8 15			— San Port, Peru -	5 10	3	
Jacmel, St. Domingo -	irr.	2-3?		Juby Cape, Africa -		8	
Jafrahad, Hindoostan, W. Coast.	11 35	9	7	Judith Point, United States	7 32	3½	3½
James Id. (Adam Cove), Galapagos.	2 14	5		Juggi, Seer R., Hindoostan, W. Coast.	1 30	6	
— N. side, Galapagos.	2 34	5		Jukan Ids., Lapland -	9 0	13	
James Id., W. end, Galapagos.	3 10	5		Julian, San, Port, Patagonia, E. Coast.	10 45	30	
James R. (City Point) U.S.	2 11	3	2½	Julianshaab, Greenland -	5 6	7	5
Jashk Shoal, Persian Gulf.	9 30	8		Julien, St., Harbour, } 7 21 A.M. } Newfoundland. } 6 30 P.M. }		4½	3
Jask Cape, Persian Gulf	6 0	6		Junk Fleet entrance, Canton River, China.	11 50	6½	
Jebogue, Bay of Fundy-	10 4	15	11½	Junk River, Africa, W. C.	5 45	5	
Jedore, Nova Scotia -	7 45	6½	4½	Junkseylon Id. (E. Side), Malacca Strait.	10 0	11½	
Jekatarina Ids., Lapland	6 23	10		Jura Island, (Small Isles), Scotland.	5 3	3½	2½
				— Feolin Ferry " -	4 41	6½	4½
				Juria, Hindoostan, W.C.	2 0	16	13

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Kaikora Penin, New Zealand.	5 30	8	6	Killala Bay, Ireland -	5 22	10½	8
Kaipara Harb. (entrance), New Zealand.	10 55	10	8	Killeany Bay, Arran Ida., Ireland.	4 28	13½	10
Kalgalaksa, White Sea	6 50	7		Killingholme (Humber R.), England.	6 2	19½	15½
Kalian Point, Banka Strait	8 17*	12½		Killybegs, Ireland -	5 16	11½	8½
Kandalaksha, White Sea	3 25	7		Killyleagh, Ireland -	12 40	11	9½
Kanushin Cape, White Sea	11 54	15		Kilmichael Point, Ireland	8 30	4½	3
Kapiti Island, New Zealand	9 0	6		Kilrush, Ireland -	4 42	14	10½
Karáchi Harb. (entrance) Hindoostan, W. Coast.	10 30	9½	6	Kincardine, Firth of Forth, Scotland.	2 53	17½	15
Karakoa Bay, Owyhee -	3 49			King Id., Bass Strait -	1 0		
Kari or Lukput River, entrance, Hindoostan, W. Coast.	11 15	10½		King Port, Falkland Ida.	7 30	5	
	12 15	12		— Sound, Australia, W. Coast.	0 10	33	
Lukput, Hindoostan, W. Coast.	11 15	10½		— George Sound, Australia, S. Coast.	11 56	1-4	
Kotasir, Hindoostan, W. Coast.				Kingsbridge, England -	5 46	10	
Kata, Japan Sea - -	6 4	6½		Kingstown, Ireland -	11 10	11	8½
Katwyk, Netherlands -	2 30	5	7	Kinsale, Ireland -	4 43	11½	9
Kawau Id., New Zealand	6 30	10		Kinsiang Point, China, E. Coast.	7 0		
Kawhia Harb., New Zealand.	9 30	12		Kircubbin, Ireland -	12 42	11½	9½
Keats Port, Australia, N. Coast.	6 0	22		Kirindi, Ceylon - -	3 30		
Kediwári R., Hindoostan	9 57	7		Kirkcudbright, Scotland	11 10	23	
Keelacarry, Ceylon -	11 0			Kirkwall, Orkneys -	10 9	10	7½
Kedgerree, Bay of Bengal	11 30			Kishm, see Kesm.			
Keeling Islands (Port Refuge), Indian Ocean.	5 30	5		Kiswara Harb., Africa, E. Coast.	4 30	12	
Kegashka B., G. St. Lawrence.	10 45	5	3	Kitnapatnam, Bay of Bengal, W. Coast.	11 0	1½	
Kelung Harb. (Formosa), China Sea, E. Coast.	10 30	3		Kiu-kiang, China, W. C.		24	
Kenmare R. (W. Cove), Ireland.	3 52	10	7½	Klaskino Inlet - -	12 0	12	
Kenu Reef, Australia, E. Coast.	8 0	5½		Klaskish Inlet, Vancouver Id.	12 0	12	
Kennebec River (Hanniwells Point), U.S.	11 15	9½	7	Knox Bay, Vancouver Id.	12 0	16	
Kent Island, Bass Strait	11 10			Koelwatte Bay, Moluccas		7	
Kentish Knock, England	11 47			Koepang, Timor - -	11 0	9	6½
Keppel Bay, Australia, E. Coast.	9 30	9-14		Kokohu, New Zealand -	10 15	10	7
Keret, White Sea -	3 8	6		Ko-kun-to Group, Korea, W. C.	2 25	18	10
— Point, White Sea	4 30	5½		Kok-si-kon Prt. (Formosa) China Sea, E. Coast.	11 30	3	
Kerguelen Island, Indian Ocean.	2 0	2		Koombanah B., Australia, W. Coast.	9 0	½-3	
Kesm, Persian Gulf -	11 0	12		Kouloi River - -	1 15	20	
Kettle Cove, United States	7 48	5	4½	Kou Zomen, White Sea -	3 30	6	
Khór Jerámeh, Arabia, S.E. Coast.	9 30	10		Kovda Bay, White Sea -	3 25	6	
Kijouk Phyou Harbour, Bay of Bengal.	10 0	9	6	Koweit, Persian Gulf -	0 15	9	
Kilbaha, Ireland -	4 16	13	9½	Kowie River, Africa, S. Coast.	4 0	4-5	
Kilda, St., Hebrides -	5 30			Krakatoa, Strait of Sunda	7 0	4	
Kildin Id., Lapland -	6 45	12		Kúdi River, Hindoostan, W. Coast.	9 50	10	
Kilkieran Cove, Ireland -	4 34	15½	11	Kuper Harbour, Korea, S. Coast.	9 28	11½	8½
				— Port, America, N.W. Coast.	1 40	13	10½
				Kuriyán Muriyán Bay and Islands, Arabia, S.E. Coast.	8 20	6½	

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Kurrachee, see Karachi.				Lawrence, Great St., Harb.	8 30	7	4
Kutch, Gulf of, (mouth), Hindoostan.	11 30			Newfoundland.			
Kweshan Ids., China, E. Coast.	9 30	14		Le Have Cape, Nova Scotia.	7 48	7	5½
Kyan-chau Bay, Yellow Sea.	5 0	12	9	— Nova Scotia, Crooked Channel.	7 51	7½	6
Kyem River, White Sea	5 23	4		— Mothers Island	7 51	7	5½
Kykduin, Netherlands -	7 0	12		— Getsons Cove	7 55	7½	6
Kyle Akin, Loch Alsh, Scotland.	6 16	15½	11	— Bridgewater (McKean's Wharf.)	8 6	8	6½
Kyle Rhea, Scotland -	6 0	15	11	— Lunenburg (Spidlers Cove.)	7 54	7½	6
Kyuquot Sound, Vancou- ver Id.	12 0	12		Le Maire Strait, Tierra del Fuego.	4 0	7	
La Poile Bay, New- foundland.	9 0	6	4	Leervig Fiord, Færø Ids.	0 30	6½	4½
Labuan Island, Victoria Harbour, Borneo.	9 45	6		Leith, Scotland -	2 17	16½	12½
Labyrinth Ids., Magel- lan Strait.	0 30	5½		Leman Shoal, England, E. Coast.	6 0		
Lacul Harb., St. Domingo	6 0?	3?		Lennox Cove, Tierra del Fuega.	4 40	8	
Lady Bay, Australia, S.C.		4		Leopold Port, Barrow Str.	12 6	6	4½
Lady Elliot Islet, Aus- tralia, E. Coast.	9 0	7-8		Lepreau, Bay of Fundy -	11 18	24½	21
Lagos, Portugal -	2 7	13		Lerwick, Shetland -	10 30	6	4
— River (Bar), Bight of Benin.	6 0	3		L'Etang Harb., Bay of Fundy.	11 19	23½	20
Lagos River (Consulate Wharf.)		2		Leubu River, Chile -	10 30	5	
— (Palaver Ids.)		1		Leven Port, Madagascar	3 30	7½	
Laguimanoc Port, Luzon	1 30	5½		Levrier Bay Africa, W. Coast.	12 0	6-7	
Laguna de Terminos, G. of Mexico.	noon.	1½		Lewis Cape, St. Labrador	6 30		
Lakadivh Group, Hindoo- stan, W. Coast.	10 30	6	4½	Liant Cape (G. of Siam), China Sea, W. Coast.	5 7	6½	
Lamalin, Newfoundland	9 15	8½		Liau Ho (Bar), Yellow Sea.	4 0	11½	7½
Lambayeque Rd., Peru -	4 0	3		— (entrance) -	5 0	12	
Lamlash, Scotland -	11 49	10	7	Liau-tung, Chingho, Yellow Sea.	1 20	6½	
Lamo Harb., Africa, E. Coast.	4 6	11		— Gulf (Sand Point), Yellow Sea.	4 50	7	5½
Lancaster, England -	11 16	8½		— N.W. Head of Gulf.	5 30	10	8½
Landshipping, Cleddau River, Wales.	6 27	20	14½	Limbé Strait, Moluccas -		5	
Langshan Crossing, Yang- tze-Kiang.*	1 40	12	8	Limerick, Ireland -	6 16	18½	13½
Lakeet Island, Canton River, China.	11 20	6½		Lindy River (entrance), Africa, E. Coast.	4 15	12	
Lansow Bay, China, E.C.	10 0	13		Lingeb, Persian Gulf -	12 0?		
Lanzarote, Canary Ids. -	1 0?	9?		Lintin Island, Canton R. China, E. Coast.	12 0	7½	
Laredo B, Magellan Str.	11 30	9		Lisbon (Belem), Portugal	2 30	12	9
Largs, Scotland -	11 50	10		Liscanor Bay, Ireland -	4 23	13½	10
Latham Id., Africa, E. Cst.	4 0	10		Liscomb Harb., Nova Scotia.	8 0	6½	4½
Latitude Bay, Tierra del Fuego.	2 5	4		Lishan Bay, China, E. C.	10 15	16	
Li-mu ho, Yellow Sea -	1 30	5		List, Denmark -	2 21	6	
Lun, Great and Little, Newfoundland.	8 15	7	4	Litau Bay, Yellow Sea -	3 0	6	4
Lura Harb., Tierra del Fuego.	1 0	6		Litke Ridge, White Sea -	11 45	15	
Lutata Bay, Chile -	9 20	5		Little Egg Harbour, } United States - }	7 10	4½	3½
				Little Fish Bay, Africa, W. Coast.	2 30	5-6?	

* the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Little Gull Island, U. S. -	9 38	3	2 $\frac{1}{2}$	Loch Ryan (Head of Loch)	11 12	11	
Littlehampton, England	11 36	16	11 $\frac{1}{2}$	— Skipport „ -	5 52	12 $\frac{1}{2}$	9
Little Metis, G. St. Lawrence.	2 10	13	8	— Strivan „ -	11 55	6	
Little Milford Quay,	6 31	19	13 $\frac{1}{2}$	— Sunart „ -	5 40	13 $\frac{1}{2}$	
River Cleddau, Wales.				— Tarbert, West, Harris Island, Scotland.	6 4	11 $\frac{1}{2}$	8 $\frac{1}{2}$
Little Natashquan, G. St. Lawrence.	11 0	5	3	— — East „ „	6 10	13 $\frac{1}{2}$	10
— Port, Newfoundland.	10 42	5 $\frac{1}{2}$		— — West, Argyleshire, Scotland.	2 30	1-4	
Little Tancock Island, Nova Scotia.	7 43	7 $\frac{1}{2}$	6	— — East „ „	11 53	9	
Liverpool, England -	11 23	26	20 $\frac{1}{2}$	— Tongue „ -	7 53	15	12
— Bay, Nova Scotia.	7 50	8	5	— Torridon „ -	6 20	15	11
Liza Bay, Lapland -	5 58	9		— Tuadh „ -	5 29	11 $\frac{1}{2}$	8
Lizard Id., Australia, E. Coast.	9 15	7-10		Lofoten Ids., Norway -	12 0	9	7 $\frac{1}{2}$
Lizard Point, (Perran Vose Cove), England.	5 0	14 $\frac{1}{2}$	10 $\frac{1}{2}$	Loheia, Red Sea -	1 30	3	
Llanelly (Bar), Wales -	6 16	28	21	Loire R. (St. Nazaire), France.	3 40	15 $\frac{1}{2}$	11
Lloyd Port, Bonin Ids. -	6 8	3		Lomas Point, Peru -	8 19	5	
Loanda, San Paul de, Africa, W. Coast.	4 30	5		Lombok, (Ampanamb.), Java Sea.	8 0	6	
Loango Bay, Africa, W. Coast.		6 $\frac{1}{2}$		London Bridge, England	2 7	19 $\frac{1}{2}$	16 $\frac{1}{2}$
Lobah Point, Banka Strt.*	11 0 $\frac{1}{2}$	10		— Docks, England	1 57	19 $\frac{1}{2}$	17
Lobito B., Africa, S.W. Coast.	2 20	5		Londonderry, Ireland -	8 1	7 $\frac{1}{2}$	5 $\frac{1}{2}$
Lobo Point, Peru -	8 0			Looe (East), England -	5 26	16	13
Lobos Cay, Bahamas -	7 40	3		Lookout Point, United S.	0 58	2	1 $\frac{1}{2}$
Lobos Head, Patagonia, W. Coast.	0 29			Lopez Cape, Africa -	4 30	4-6?	
Loch Aline, Scotland -	5 33	13 $\frac{1}{2}$	10 $\frac{1}{2}$	L'Orient (Port Louis), France.	3 11	13	9 $\frac{1}{2}$
— Alsh „ -	6 16	15 $\frac{1}{2}$	11	Lord Howe Island, S. Pacific.	8 30	6	
— Boisdale „ -	5 47	12 $\frac{1}{2}$	9 $\frac{1}{2}$	Lo-shan-kau, Yellow Sea	4 30	11	9
— Broom „ -	6 40	14 $\frac{1}{2}$	10 $\frac{1}{2}$	Lough Larne, Ireland -	10 48	6 $\frac{1}{2}$	6 $\frac{1}{2}$
— Carron „ -	6 29	16 $\frac{1}{2}$	11 $\frac{1}{2}$	— Rossmore, Ireland	5 20	11	8
— Cuan „ -	5 36	13	9 $\frac{1}{2}$	Louis Port, France -	3 11	13	9 $\frac{1}{2}$
— Duich „ -	6 0	15 $\frac{1}{2}$	11	— Mauritius -	12 30	3	2 $\frac{1}{2}$
— Dunvegan „ -	6 7	15 $\frac{1}{2}$	11	Louis, St., Bay, St. Domingo.	irr.	2-3?	
— Eil (Head of Loch)	6 27			Louisburg Harb., Cape Breton Id.	8 0	5	4
— Eport „ -	6 6	12 $\frac{1}{2}$	9 $\frac{1}{2}$	Low Bay, Falkland Ids.	5 0	5 $\frac{1}{2}$	
— Eriboll „ -	7 43	14 $\frac{1}{2}$	11	— Port, Patagonia, W. Coast.	0 40	7	
— Erisort „ -	6 43	15 $\frac{1}{2}$	11 $\frac{1}{2}$	Lowestoft, England -	9 57	6 $\frac{1}{2}$	5 $\frac{1}{2}$
— Etive, Stonefield „	7 3			Luabo River (entrance), Africa, E. Coast.		22	
— — Bunawe „	7 54	5 $\frac{1}{2}$		Lucas San, Bay, California	9 20	9 $\frac{1}{2}$	
— Ewe „ -	6 39	14 $\frac{1}{2}$	10 $\frac{1}{2}$	Lucipara Pass, Banka Strait.	irr.	10	7 $\frac{1}{2}$
— Goil „ -	12 6	10	6	Luis, St., Texas, G. of Mexico.		1 $\frac{1}{2}$	
— Harport „ -	5 54	13 $\frac{1}{2}$	10	Luis Obispo, San, California	10 8	4 $\frac{1}{2}$	3 $\frac{1}{2}$
— Hourn „ -	5 45	13 $\frac{1}{2}$	10 $\frac{1}{2}$	Lunaire Bay, Newfoundland.	7 0?	2-3?	
— Inver „ -	6 40	14	11	Lundy Island, England -	5 15	27	20
— Laxford „ -	6 44	15	11 $\frac{1}{2}$	Lung-mun Harbour, Yellow Sea.	10 0	7	
— Leven (Head of Loch)	6 28			Lyme Regis, England -	6 21	11 $\frac{1}{2}$	8 $\frac{1}{2}$
— Linnhe „ -	5 26	12 $\frac{1}{2}$	8 $\frac{1}{2}$	Lymington, England -	{ 10 25 } { 12 15 }	8	6
— Long „ -	12 6	12		Lynn Deep, England -	6 0	23	
— Maddy „ -	6 6	12 $\frac{1}{2}$	9 $\frac{1}{2}$				
— Moidart „ -	5 44	13 $\frac{1}{2}$	9 $\frac{1}{2}$				
— Nevis „ -	5 47	14 $\frac{1}{2}$	10				
— Roag „ -	6 11	11	8				

* In S.E. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Lynn Harbour, England		18		Malaga, Spain - -	12 0	3	
— Road - -		20		Malahide Inlet, Ireland -	11 15	10	8
Lyttelton Port, New Zealand	3 50	7½	5½	Malcolm Atoll, Maldives	10 30	3	
Mahon River, C. Breton Id.	9 0	4		Maldon, Chelmer River, England.	12 32	10	6
Macabé, Brazil - -	2 30	9½		Malé, Maldives - -	12 30	3	
Macao, China, E. Coast -	10 0	6½		Malludu Bay, Borneo -	10 30	6-8	
Macassar, Celebes -	4 40	5½		Malo, St., France -	6 5	35	26
McDougall Harb., Africa, S.W. Coast.	2 30	5½		Malpelo Point, Peru -	4 0	10	
Maceio, Brazil - -	4 30	8½		Man-of-War Cay, Bahamas.	8 10	4	
Machias, Seal Id., Bay of Fundy.	11 5	18	14½	Mana Island, New Zealand	7 0	8	6
Macowa, Red Sea -	0 30	2		Manama, Persian Gulf -	5 20	7	
Macquarie Harbour, Tasmania.	7 30	3		Manawatu River, New Zealand.	10 0	8	6
— Port, Australia, E. Coast.	8 56	4-5		Mancenilla Bay, St. Domingo.	7 0	4-5	
Macquereau P., G. St. Lawrence.	2 0	5	3	Mandwa Creek, Hindoostan, W. Coast.	10 45	7	5
Madame Id., Madagascar	4 0	5		Mangalore, Hindoostan, W. Coast.	11 0	7	5½
Madoc Port, Wales -	7 30	17		Manganitoe Bay, Moluccas.	5 0		
Madras Road, Coromandel Coast.	7 34	3½		Mangarol Bunder, Hindoostan, W. Coast.	10 30	7	5
Magadoxa, Africa, E. Cst.	4 30	8		Maniconagon River, R. St. Lawrence.	2 15	12	7
Magdalen Ids., G. St. Lawrence.	8 20	3	2	Manila (Luzon Island), China Sea, E. Coast.	10 40	2½	
— River, R. St. Lawrence.	11 0			Manna, Navigators Ids. -		6	
Magdalena Sta., Island, Magellan Strait.	12 0	10		Manning River, Australia, E. Coast.	9 15	4	
Magdalene B., California	7 35	6½		Manorah R., Hindoostan, W. Coast.	1 30	16	
Mahato Id., Africa, E.C.	4 30	7		Manta Port, Ecuador -	3 4	6	
Mahneah R., Africa, W.C.	7 40	11		Manukau Har. (entrance), New Zealand.	9 30	13	10
Mahone Bay, Nova Scotia	8 0	7		Manybranch Harb., Falkland Ids.	7 40	7½	
— Heckmans Anchorage.	7 45	7½	6	Maple Bay, Vancouver Id.		12	
— Princes Inlet	7 42	7½	6	Maplin Light (Thames), England.	12 5	14½	10½
— Ham Island	7 47	7½	6	Maquereau Point, G. of St. Lawrence.	2 0	5	3
— Martins R. -	7 43	7½	6½	Maranham, Brazil -	7 0	16½	10½
— Chester -	7 44	7	5½	Marblehead, United States	11 30	12	
Mahons R., United States	9 52	7	5½	March Harb., Tierra del Fuego.	3 10	6	
Maiden Rocks, Ireland, N.E. Coast.	10 43	6½	6½	Marcouf, St., France -	9 55	20	
Majambo B., Madagascar	4 30	16		Mare Harb., Falkland Ids.	6 0	6	
Makátein, Arabia, S.E. Coast.	9 0	6		Margarets, St., Bay (Shut-in Island) Nova Scotia.	7 47	7½	6
Makalleh, Arabia, S.E. Coast.	8 30	7		— Newfoundland	9 28	4½-6½	
Makongai Id., Fijii Ids. -	6 0	4	3	Margate, England -	11 40	15½	13
Makumba R., Madagascar	4 45	17		Maria Cape, Saghalin Id., Sea of Okhotsk.	2 0	5	
Makung Harb., Pescadres, China Sea.	10 30	9½	7	Maria Sta., Id., Chile -	10 20	6	
Makbrigo Port, Peru -	5 0	2		Maria Van Diemen Cape, New Zealand.	8 0	7	
Malacca Strait (light vessel, one fathom bank).	6 0	15	12				
— (off Mount Formosa).	8 0	11	8½				
— Road, Malacca St.	7 30	11	8½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Maristow, River Tavy, England.	5 47	8½	4½	Mellish Reef (Sand Cay), Australia, E. Coast.	7 55	5-6	
Marjoribanks Harbour, Korea, W. C.	3 30	29		Mellon, Ireland -	6 1	18½	13½
Mark, St., Bay of, St. Domingo.	8 07	1?		Melo Port, Patagonia, E. C.	3 40	15	
Marka or Muerka, Africa, E. Coast.	4 30	8		Memory Rock, Bahamas.	7 50	3	
Marks, St., United States	1 14	3	2½	Menadou Bay, C. Breton Island.	8 15	5½	
Maroni Bay, Comoro Ids.	4 53	10		Menam River, (Paknam), China Sea, W. Coast.	5 7	9½	
—— River, Guayana	5 30	8	6	Menemsha Bight, U.S. -	7 45	4	2½
Martaban, Bay of Bengal	2 20	21		Mensular Id., S.E. end, Sumatra.	6 0	4	
Martin, St., Cove, Tierra del Fuego.	3 30			Merbát, Arabia, S.E. Cst.	9 0	6½	
—— C. Horn Ids., Tierra del Fuego.	3 50	8		Mercy Bay, Banks Land		2	
Martin, St., de la Arena, Spain, N. Coast.	3 30	15		Mercury Bay, New Zealand.	7 21	7	5
Martin Vas Rocks, South Atlantic.	3 45			Mergui, Bay of Bengal, E. Coast.	10 30	18	
Martinique, Robert Harb. Carribean Sea.	-	4-5		Merigomish, Nova Scotia	10 6	5½	3½
Mary, Cape St., Newfoundland.	8 30	7	5	Merville, France -	9 36	21	17½
Mary St. Harb., Madagascar, E. Coast.	4 0	5		Metway Port, Nova Scotia	7 50	8	5
—— Newfoundland -	7 40	7½	5	Mevagizey, England -	5 4	15½	12
Mary, Port St., I. of Man	11 10	20	16	Mexillones Port, Bolivia	10 32	3	
—— St., Scilly Is. -	4 18	15½	11½	Mezen, White Sea -	1 48	15-22	
Maryport, England -	11 3	18	13	M'hul Dwarka, Hindoostan, W. Coast.	10 30	7	
Mascat, Persian Gulf -	11 15	6		Miau-tau, (Depôt Bay), Yellow Sea.	10 35	6	
Mason B., New Zealand	11 10	8	6	Miaveness, Færoe Islands	3 12	6½	4½
Massacre Bay (Tasman corner), New Zealand.	8 45	18	9	Michael, St., Azores -	12 30	6	
Massacre Bay, Motu Pipi River, New Zealand.	9 50	14	10	Michael Seymour Port, Gulf of Tartary.	5 30	3	
Massowah, Red Sea -	1 0	3		Middle Cove, Tierra del Fuego.	3 30		
Matacumbe Bay, Lower United States.	8 23	2½	1½	Middle Island, Patagonia, W. Coast.	12 0		
Matan River, G. St. Lawrence.	2 15	11	7	Middlesbrough, R. Tees, England.	3 55	13	
Matuku, Fijii Ids. -	6 18	5	3	Middleton R., Bight of Benin.	4 15	5	
Maule River, Chile -	10 0	5?		Milford Haven (St. Ann Lighthouse), Wales.	5 56	24	19
Maulmain, Bay of Bengal,	2 0	22	17	Milford Sound, New Zealand, Mid. Island.	9 15	8	6
Mauritius (Port Louis) -	12 30	3	2½	Millman Island, Palawan, W. Coast.	10 27	2½	
—— (Grand Port) -	1 0	1½		Millport, Cumbrae Island, Scotland.	11 50	10	6
May Cape, United States	8 19	6	5	Min R. (Temple Point), China, E. Coast.	10 45	19	14½
Mayday Bay, Palawan -	9 55	3½		Min R. (Losing Island), China, E. Coast.	12 0		
Mayhé Id., Indian Ocean	4 0	6½		Mindanao, S. Point Filipinas.	7 0	6	
Mayotta Id., Mozambique	4 10	11½		Minehead, England -	6 30	35	26½
Mayumba, Africa, S.W.C.		7		Mingan Harbour, Gulf St. Lawrence.	1 16	6	4
Mazambo Port, Madagascar.	4 30	15		Mingan Id., G. St. Lawrence	1 30	6	4
Mazatlan, Mexico, W. Cst.	9 40	7		Minimegash, Prince Edward Island.	3 30	5	3
Mboli Harbour, Florida Id., Solomon Ids.	5 30	6					
Meichen Sound, China, E.C.	12 30	17					
Melbourne, Australia, S. C.	2 48						
Melinda P., Africa, E. C.	4 15	11					
Mellacoree R., Africa, W. Coast.	7 40	11					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Minow Islands, Madagascar, W. Coast.	5 0	15		Mouton Port, Nova Scotia	7 54	7½	5½
Minquiers Rocks, France	6 6	35	26	Moville, Ireland - -	7 6	7½	5½
Miramichi (Bar), Gulf St. Lawrence.	5 30	5	3	Mowah Bunder, Hindoo-stan, W. Coast.	1 0	12	9½
Mira-por-voa, Bahamas -	9 30	3	2½	Mozambique Har., Africa, E. Coast.	4 15	12	
Mirs Bay (Tide Cove), China, E. Coast.	10 0	6½		Mncaras Reef, Bahamas	7 40	3	
Miscou, G. of St. Lawrence.	2 30	5	3	Muerka, see Murka.			
Mississippi, S. W. Pass, Gulf of Mexico.		1½		Mugeres Harb., Bay of Honduras.	9 30	1½	
Mistanoque, Labrador -	10 30	6	3	Mull of Cantyre, Scotland	10 35	4	
Mistley Quay, Stour R., England.	0 48	11½		Mulroy Bay (Bar), Ireland	5 40	11½	8
Mobile, Gulf of Mexico	irr.	1-2		Mumbles Lt. House, Wales	6 1	27½	20½
Mocha Island, Chile -	10 30			Mungalaum Id., China Sea, E. Coast.	11 0	5	
Mocha Road, Red Sea, (E. Coast).	12 0	4½		Mungullo or Mongallo R., Africa, E. Coast.	4 45	12	
Mogador, Africa, W. Cst.	1 18	10-12		Murdounah Id. (E. Cst.), Red Sea.	6 0	3	
Molyneux Bay, New Zealand.	3 0	8	6	Murray Islands, Torres Strait.	9 30	10	
Mombasa Port, Africa, E. Coast.	4 0	11		Murray Pass, Bass Strait	11 10	8	
Monach Ids., Scotland, W. Coast.	5 44	12½	8½	Musa Port, Babuyan Ids.		5	
Monckton (Railway), Bay of Fundy.	0 15	47	37½	Mutlah River, (entrance to Biddah River), Bay of Bengal, W. Coast.	10 0	14	
Mondego (Bar), Portugal	2 30	7		Mutlah (Muda Kali), Bay of Bengal, West Coast.	11 45	15	
Monganui Harb., New Zealand.	8 15	9	7	Mutton Island, Ireland, W. Coast.	4 20	13½	9½
Monomoy, United States	11 30	5½	4	Myggenæs Fiord, Færoe Islands.	9 0	9½	7½
Monrovia, Africa, W. C.	6 0	6		Na Vatu Reef, S. Pacific	6 8	4	
Montauk Pt., United States.	8 20	2½	2	Naafe R., Bay of Bengal, E. Coast.	10 0		
Monterey, California -	10 22	4½	3½	Naalsøe Fiord, Færoe Islands.	4 0	6½	4½
Montgomery Isles, Australia, W. Coast.	12 0	36		Nafa-Kiang, Loo Choo Islands.	6 28	7	
Montrose, Scotland -	1 25	13	10	Nagasaki Bay, Japan Sea.	7 15	9	7½
Moats, Point de, Gulf St. Lawrence.	12 0	12	6	Nagore, Bay of Bengal, W. Coast.	8 15		
Moreno (Constitucion Road), Peru.	10 0	4		Nairai Id., Fijii Ids. -	5 53	4½	3½
Moreton Bay, Australia, E. Coast.	9 30	3-7		Namki Ids., China, East Coast.	8 30	17	
Morewellham, R. Tamar, England.	6 12	10½	6½	Namo Harbour, China Sea, W. Coast.	10 0	7½	
Morjovets Id., White Sea	11 20	17		Namoa Island (Clipper Road), China, E. Coast.	11 15	7	
Morlaix Road, France -	4 53	24	18	Namquan Harb., China, E. Coast.	10 0	17	
Morro (Sandy Pt.), Ecuador.	5 0	11		Nanaimo Harb., Gulf of Georgia, Vancouver Id.	5 0	14	
Mossel B., Africa, S. Coast.	3 30	6		Nancowry Harb., Nicobar Islands.	9 15	8½	
Moudinga Id., White Sea	5 50	3½		Nandi Passage and Bay, S. Pacific.	6 35	4½	
Mount Desert Island, United States.	11 10	13		Nangamessie Harbour, Sumba.	11 30	17	13½
— Louis Bay, R. St. Lawrence.	11 0	6-8	4				
Mourondava, Madagascar, W. Coast.	4 45	12					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Nangka Id., Banka Strait		12		New Ross, Ireland -	6 4	12½	10
Nanoose Harbour, Vancouver Id.	5 0	15		— Year Sound, Tierra del Fuego.	3 30		
Nantucket, United States	12 24	3½	3	— York, United States	8 13	5½	4½
Napoleon Road, Gulf of Tartary.	2 30	2½		Newburyport, United States	11 22	9	7½
Narrinda Bay, Madagascar, W. Coast.	4 30	15		Newcastle, Australia, E. Coast.	9 45	6-7	
Narrows (First), Magellan Strait.	9 0	36-42		— England -	4 23	10½	
— (Second), Magellan Strait.	10 0	23		— Ireland -	11 4	14½	12
Naruto (Fukura) Japan Sea.	6 17	7		Newhaven, England -	11 51	20	15
Nash Point, Bristol Channel.	6 25	33	25	Newport, United States -	7 45	4½	4
Nasparte Inlet, Vancouver Id.	12 0	12		— Wales, (South Coast.)	7 10	39	29
Nassau, New Providence, Bahamas.	7 30	4	3	— (W. C.)	7 0	12	9
Nassau Bay, Tierra del Fuego.	4 0	6		New Quay, Wales -	7 30	15	
Natal Port, Africa, S. C.	4 30	6		Newton Stewart, Scotland, W. Coast.*	12 0	12	6
Naturaliste Channel, Sharks Bay, Australia, N.W. Coast.	11 45	6		Nhatrang Bay, China, W. Coast.	8 30	5½	
Navallo Port, France -	3 42	13	9½	Nicholas, St., Harb., G. St. Lawrence.	1 55	12	7
Nazaire, St., France -	3 40	15½	11	— Port, Peru	5 15	3	
Naze, The, England -	12 6	12½	10	Nicholson Port (Lambton Harbour) New Zealand.	4 30	5	3
Nee-ah Harbour, Oregon	12 33	7½	6½	Nicobar Id. (Nancowry Harb.), Indian Ocean.	9 15	8½	
Needles Point, England -	9 46	7½	5	Nicolas, St., Bay, Magellan Strait.	2 6		
Negapatam, B. of Bengal	5 0	3		Nicoya Gulf (Port Heradura), Cent. America.	3 9	10	
Negro Harbour, Nova Scotia.	8 12	7	5½	Nieuport, Belgium -	12 18	16	13
Negro River, Patagonia	11 0	14		Nieuwediep, Netherlands	7 27	4	3½
Nelson, New Zealand -	9 50	14	10	Niger River (Nun entrance), Africa, W. Coast.	4 8	6	
— Port, Australia, N.W. Coast.	12 0	27		Nikolskoi Chan., White Sea.	5 25	3	
Nerbudda River (Broach Point, Hindoostan, W. Coast.	3 40	25		— Twr., White Sea	6 0	2	
Neuf Port, Gulf St. Lawrence.	2 10	13	8	Nimrod Sound, China, E. Coast.	10 30	20	
—, River St. Lawrence.	8 30	14	9	Ninepin Group, China E. Coast.	10 0	5	
Neville Port, Vancouver Id.	0 30	17		Ning-hai, Yellow Sea -	12 0	6	
New Bedford (entrance), United States.	7 57	4½	4	Nin-po-fu, Yung River, China E. Coast.	1 0	9	
— Castle, United States	11 53	7	6½	Nisqually, America, N.W. Coast.	6 0	18	15
— Haven, United States	11 16	6½	5½	Noamh Island, Scotland	5 2	11½	7
— London, United States.	9 28	3	2½	Noel, Bay of Fundy -	12 41	50½	43½
— Providence, S. W Bay, Bahamas.	7 30	4		Noir Island, Tierra del Fuego.	2 30	5	
— Perlican Harbour, Newfoundland.	7 30	4	2½	Noirmoutier, France -	3 2	16	11½
— Rochelle, United States.	11 22	8½	7½	Nolloth Port, Africa, S.W. Coast.	2 30	5½	
				Nootka Sound, Vancouver, Id.	12 0	12	
				Norderney, Germany -	10 30	8	
				Nore, England -	12 30	15½	13
				Norfolk Island, S. Pacific	7 45	7	
				North Balabac Strait, China, E. Coast.	10 50	5	

* At Carty Quay.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
North Cape, C. Breton Id.	8 0	4		Oonting Port, Ioo Choo Islands.	6 35	8	
—— Edisto River, United States.	7 10	7	5½	Oösima, Japan Sea -	6 50	5	
North Harbour, Newfoundland.	8 0	7½	5	Oporto, Portugal -	2 30	10	
—— Sands, Malacca Strait.	5 30	15	12	Orange B., T. del Fuego	3 30	5	
Nesari Khari (Bar), Hindoostan, W. Coast.	3 0	18		—— Cape, Magellan Str.	3 0		
Noss Island, Madagascar	5 0	15		Orford Haven (Bar), England.	11 30	7½	
Noumea Bay, New Caledonia.	8 25	4		—— Port, California -	11 26	6½	4¾
Nova Zembla Harbour, Lapland.	6 36	10		—— Quay, England -	12 30	7½	
Nowanugga, Hindoostan, W. Coast.	1 45	18	14	Orfordness, England -	11 15	8	6½
Nuchatlitz Inlet, Vancouver Id.	12 0	12		Orinoco River (entr.) Guayana.	6 0	3	
Nuevo Gulf, Patagonia, E. Coast.	7 0	10		Orleans Id., R. St. Lawrence.	5 40	17	13
—— Port, Central America.	3 10	12		Ormond, Kenmare River, Ireland.	3 43	10	7½
Nakulan Port, Fijii Ids.	6 47	5½		Ornsay, L of Skye -	5 50	14½	10¼
Nama-choa, Comoro Ids.	3 0	14		Orlov Letni C., White Sea.	5 18	4	
Nuez River, Africa -	10 0	15	11½	Os Ilheos, Brazil -	4 30		
Nyminde Gab, Jutland -	2 41	2		Osaki, Japan Sea -	5 55	6½	
Nysna Harbour, Africa, S. Coast.	3 45	5		Oscuro Cove, Patagonia, W. Coast.	0 55	20	
Oban, Scotland -	5 22	12	9½	Osprey Reef, Australia, E. Coast.	8 36	6	
Obb of Harris, Isle of Harris, Scotland.	6 16	11½	8½	Ostend, Belgium -	12 25	19	15
Observatory Id., China Sea, E. Coast.	11 0	5½		Otago Har., New Zealand	2 50	7	5
Ocrascocke Inlet, United States.	7 4	2½	2	Otaheite, South Pacific -	noon	1½	
Octavia Bay, New Granada.	3 30	13		Otterswick, Orkneys -	9 13	11	8
Oelar Cape, Banka Strait	6 30	12		Otway Port Patagonia, W. Coast.	11 37	6	
Oho Sima, Loo Choo Ids.	7 30	5½		Ou ou Kinsh Inlet, Vancouver Id.	12 0	12	
Oibo Harb., Africa, E.C.	4 15	6		Ounalashka Id., America, N.W. Coast.	7 30	7½	
Olaveaga, Bilbao River, Spain.	3 15	12		Ouro R., Africa, W. Cst.	12 0	8-9	
Old Pt., Comfort, United States.	8 17	3	2½	Ower Shoal, England, East Coast.	6 30		
Old Providence, Bay of Honduras.	irr.	1		Oxbaasheia, Svec Fiord, Norway.	12 0	8	
Olenji Islands, Lapland -	7 30	12		Oyster Bay, United States	11 7	9½	8
Oleron, Ile d'. France -	3 50	19		Oystreham, France -	9 38	21	16
Omaider Island (Gulf of Akabah), Red Sea.	6 0	4		Packsaddle Bay, Tierra del Fuego.	3 30	6	
Omersari R., Hindoostan, W. Coast.	1 45	18		Padstow, England -	5 13	20½	16½
Omonville, France -	7 29	15½	12½	Pagham (entrance), England.	11 30	16½	12½
Om-rasas-Masirah, Arabia, S.E. Coast.	10 0	10		Pago Pago, Navigators Ids., S. Pacific.			4½
One Fathom Bank Light, Malacca Strait.	6 0	15	12	Paimpol, France -	6 0	31	23½
Omega River, White Sea	9 17	6-7		Palais, Port le, Belle Ile, France.	3 18	14½	10½
Ono Ids., Fijii Ids. -	6 0	4		Palliser Cape, New Zealand	6 0	6	
Oologan Bay, China Sea, E. Coast.	9 30	5½		Palm Isles, Australia, E. Coast.		8-10	
				Palma, Canary Ids. -	12 30?	9?	
				Palmas Cape, Africa, W. Coast.	4 30	4	
				Palmedo Road, Sumba Id.		15	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Noaps.			Springs.	Noaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Palmeira Point, Ceylon -	9 30	7-11		Pelorus Sound, New Zealand.	9 35	11	7
Paluan Bay, Mindoro -		5		Pemba Channel, Mozambique.	4 0	11	
Pamarung Ida, Borneo, E. Coast.		8-10		—— Id., Mozambique	4 15	12	
Pampang Bay, Java -		7-8		Pembroke Dockyard, Wales.	6 12	21	15½
Panama Road, Central America.	3 23	15-22	10-16	Penang, Malacca Strait -	12 0	9	7½
Pancol, China Sea, E.C.	9 40	6		Peñas Cape, Tierra del Fuego.	6 2	12	
Pansand Hole, England -	12 0	15½	13	Pender Harb., Strait of Georgia, B. Columbia.†	6 0	13	
Paposo, Chile -	9 40	5		Peniche, Portugal -	1 54		
Paquique Cape, Bolivia -	9 45			Penmark Rocks, France	3 16		
Para, Brazil, N. Coast -	12 0	11		Pennington R., Bight of Benin.	4 15	5	
Parahiba, Brazil -	5 0	9-12		Pensacola, G. of Mexico		1½	
Parenga-renga Harbour, New Zealand.	7 54	7		Pentillie, R. Tamar, England.	5 55	13½	9½
Parida Id., New Granada	3 15	10½		Pentland Firth, Stroma, S. Side.	9 47	7½	6
Pariboro, Bay of Fundy	12 17	43	37½	—— Swona, E. Side	10 24		
Pasado Cape, Ecuador -	3 30	10		—— W. Side	9 35		
Pasages Port, Spain -	3 0	12	9	—— Great Skerry, E. Side.	11 4	7½	6½
Passage or Culebra P., Caribbean Sea.	9 0	1		—— W. Side	10 53		
—— Id., Banda Sea -	noon	6		Penzance, England -	4 30	16½	12½
Passandava Bay, Madagascar, W. Coast.	5 0	15		Percy Isles, Middle or No. 1 Id.	10 30	16	13
Patapasco R. (Bodkin Pt.) United States.	5 42	1½	1	—— South or No. 2 Islet, Australia, E. Coast.	10 30	14	
Paterson Port, Australia, N. Coast.	4 0	16-24		Perim Id., G. of Aden -	12 0	7	
Patersons Inlet, New Zealand.	1 10	5	6	Pernambuco, Brazil -	4 45	8-6	
Patrick Port, Scotland -	11 10	15	12	Peros Banhos, Indian Ocean.	1 30	5	
Patta B., Africa, E. Cst.	4 30	10		Perouse, La, Strait, Japan Sea.	10 30	6	
Patteson Port, Vanu Lava Id., Banks Ids.	6 40	5		Perron Cape, Sharks Bay, Australia, N.W. Coast.	12 45	5½	
Paul de Loanda, San, Africa, S.W. Coast.	4 30	5		Perth, Scotland -	3 35		
Paul St. Id., Indian Ocean	11 0	3		Perula Bay, Mexico, W. Coast.		7	
—— G. St. Lawrence	8 0	5	3	Pescadore Ids. (Makung Harb.), China Sea.	10 30	9½	7
Paumben Pass, Bay of Bengal, W. Coast.	1 30	2		Peter, St., Bay, C. Breton Island.	7 30	6	4
Payta Port, Peru -	3 20	3		—— Harb., Prince Edward Island.	8 30	4	2½
Pearce Point, Australia, N. Coast.	6 55	20	26	Peterhead, Scotland -	0 34	10½	8½
Peckett Har., Magln. Strt.	12 0	6		Petit Passage, B. of Fundy	10 41	22	18
Pedro Gonzales, New Granada, (Trapichi Island).	3 50	16		Petit Port, B. of Islands, Newfoundland.	10 42	5½	
Pedro, San, Pass, Patagonia, W. Coast.	0 30	9		Petrel Bay, St. Francis Isle, Australia, S. Coast.	12 0	6	
—— San, Anchorage, California.	9 45	4½	3½	Petucura Rock, Patagonia, W. Coast.	0 50	16	
Peel, Isle of Man -	11 8	16½	13	Pheasant Point, Wusung River, China, E. C.	0 35	13	5
Pegasus Port, New Zealand	11 50	8	6	Philadelphia, U. States -	1 18	6½	5½
Peh-tang-ho, Yellow Sea	3 33	10	7½				
Pei-ho or Peking River (entrance), Yellow Sea.*	3 40	10	7½				
—— (Tien-tsin)	7 0	4½					
Pelew Islands, N. Pacific		6					
Pelican Lagoon, Kangaroo Id., Australia.	5 0	6					

* Time and rise much affected by winds.

† From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Philip B., E. side, Magellan Strait.	9 30	24		Plumper Sound (Fane Id.), Vancouver Id.	irr.	12	
Philip Port, Australia, S. Coast. } Lonsdale Point }	9 42	7	5½	Plymouth Breakwater, England.	5 37	15½	11½
Queens Cliff	10 50	3	2	—— (Sutton Pool)	5 32	15½	11½
Nepean Point	10 53	2½	1½	—— United States	11 19	11½	10½
Dromana	2 19	3	2½	—— New, New Zealand.	9 30	12	9
Schnapper Pt.	2 14	2½	2	Pomba B. Africa, E. Cst.	4 0	15	11
Bellarine Jetty	2 21	2½	2	Pomquet, Nova Scotia -	9 15	4	2½
Harvey Point	2 39	3	2½	Ponga River, Africa, W. Coast.	7 30	12	9½
Geelong -	2 30	3½	2½	Poolbeg Lt. Hse., Ireland	11 12	12-14	9-11
Williamstown	2 31	2½	2	Poole, England - -	{ 9 10 12 45 }	{ 6½ 6½ }	{ 4½ 4½ }
Melbourne -	2 48			Poolewe, Loch Ewe, Scotland.	6 39	14½	10½
Piankatank R. (Cherry Point), United States.	10 5	2	¾	Pootoo Island, China, E. Coast.	8 15	12	
Pichidangu Bay, Chile -	9 20	5		Poqueldon Harb., Patagonia, W. Coast.	0 54	18	
Pictou Har., Nova Scotia	10 0	6	4	Portaferry, Ireland -	12 0	18-21	12-16
Pidoe Bay, Lombok -		10-12		Port-au-Choix, Newfoundland.	10 47	5	
Piel Harbour, England -	11 5	28	21	Port au Prince, Saint Domingo.	8 0?	1?	
Pierre, St., Newfoundland	8 33	6½	4½	Port-en-Bessin, France -	8 57	20	15½
—— Island, China Sea, E. Coast.		4		Port Royal, Jamaica -	11 0	1	
Pigeon Bay, Yellow Sea	11 45	8		—— Sound, U.S.: Entrance - -	7 16	7½	6½
Pikishan Ids., China, E.C.	8 30	17		Beaufort - - -	7 26	3½	2½
Pillar C., Magellan Strt.	1 0			Portchester, England -	11 46	13½	10½
—— Cape, Tasmania -	1 0	6		Portendik, Africa, W. C.	10 0	6	
Pillars, R. St. Lawrence	5 0	17	10	Porth Cawl, Wales -	6 8	28½	21½
Pimlea Harb., Africa, E. Coast.	4 30	12		Porth-dyn-lleyn, Wales	8 30	16	
Pinas Bay, New Granada	3 15	14		Portishead, England -	7 16	41½	31
Pimill, Orwell River, England.	12 20	12		Portland Inlet (Salmon Cove) America, N.W. Coast.	1 8	16	
Pio Quinto Port, Babuyan Islands.	6 0	6		—— United States	11 25	10	7½
Pirie Port, Spencer Gulf, Australia, S. Coast.	7 15	9-11		—— Bay, Australia, S. Coast.	Midnight.	4	
Pisco Bay, Peru -	4 50	4		—— Breakwater, England.	7 1	6½	4½
Piti Palena, Patagonia, W. Coast.	12 23	10		Porto Frio, Brazil -	2 40	4½	
Piti River, Hindoostan, W. Coast.	10 5	9		Porto Praya, C. Verde Ids.	6 0?	5	
Placentia, Newfoundland	9 15	8		Portree, Isle of Skye -	6 32	15	10½
Plank Point, Spencer Gulf, Australia, S. Coast.	6 15	6-8		Portrieux, France -	6 0	31	23½
Playa de Incia, Cuba -	7 31	2½		Portsbridge (Portsmouth) England.	11 48	6½†	4
Playa Marie Bay, California.	9 20?	7-9?		Portsmouth Dockyard, England.	11 41	12½	10
Playa Parda Cove, Magellan Strait.	1 8			Portsmouth, United States	11 23	10	8½
Pleasant Port, Falkland Islands.	5 0	C½		Possession Bay, Magellan Strait.	9 0	36-42	
Plettenberg Bay, Africa, S. Coast.	3 10	6		—— Cape, Torres Strait.	9 0	6	
Ploughrescan, France -	5 17	25½	18½	—— Id., Torres Strait.	1 0	9½	
Ploumanach, France -	5 15	24½	18½	Post Office Island (Charles Island), Galapagos.	2 10	6	
Plumper Cove, Howe Sound, G. of Georgia, British Columbia.*	noon.	12					

* From observations made in the month of October.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Post Office Id., Torres Str.	1 0	9½		Quaco, Bay of Fundy -	11 35	30	25
Pouinipet Island, Caroline Islands, N. Pacific.	6 0	4½		Quan-chow-wan, Gulf of Tongking.		9-10	
Poulamente B., Madame Id., C. Breton Id.	7 50	6	4	Quatsino Sound, Vancouver Id.	11 0	11	
Poulton-le-Sands, England	11 26	27½	21½	Quebec, R. St. Lawrence	6 38	18	13
Poverty Bay, New Zealand	6 5	6		Queda, Malacca Strait -	12 0	5½	
Pratas Shoal, China Sea	4 0	5		Queen Charlotte Id. (entrance), New Zealand.	8 50	8	6
Preservation Inlet, New Zealand.	11 20	8	6	Queensferry, Firth of Forth, Scotland.	2 37	18	14
Preston, England - -	11 49	10	4½	Queenstown, Ireland -	5 1	11½	9
Prince Frederick Harb., Australia, N.W. Cst.	12 0	28		Quelan Cove, Patagonia, W. Coast.	0 28		
Prince Regent River (St. George Basin), Australia, N.W. Coast.	12 20	24-37		Quentin, Port San, California.	9 5	9	
Prince of Wales Strait, Banks Land.		3		Quicavi Bluff, Patagonia, W. Coast.	0 57	20	
Princes Id., Bight of Biafra	3 45	4½		Quicks Hole (S. side), U.S.	7 36	3½	3½
Princess Royal Harbour, Australia, S. Coast.	11 56	1-4		----- (N. side) -	7 31	4½	3
Prospect River, Nova Scotia.	7 43	7	6	Quilca River, Peru -	8 0	6	
Prony Bay, New Caledonia.				Quilimane R. (entrance), Africa, E. Coast.	4 15	16	
Provincetown, U. S. -	11 22	10½	9½	Quillebeuf, France -	10 6	9½	7½
Pubnico (Beach Point), Bay of Fundy.	9 25	12	10	Quiloa, Africa, E. Coast	4 45	12	
Puerto Bueno, Patagonia, W. Coast.	1 40			Quoile Quay, Strangford, Ireland.	12 45	11	9½
Puerto de Baitiqueri, Cuba.	9 7	2½		Rabat, Africa, W. Coast	1 46	9-12	
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	10		Race, Cape, Newfoundland.	7 0	6½	5
Puerto de Maravi, Cuba	7 56	2½		Rachada Cape, Malacca Strait.	5 30	13	
Puerto de Mata, Cuba -	6 49	2½		Radama Port, Madagascar, W. Coast.	4 40	13	
Puerto de la Plata, St. Domingo.	7 30	3?		Ragged Id., Sumbawa, Java Sea.	8 10	3	
Puerto de Taco, Cuba -	8 49	2½		----- Point, Borneo, E. Coast.		7	
Puget Sound (Nisqually), America, N.W. Coast.	6 0	18	15	Raine Id., Torres Strait	8 10	10	
Pugwash Harbour, Nova Scotia.	10 30	7	4	Rajang River, Borneo -	4 45	13	9
Pulaski Fort, United States	7 20	8	7	Rajapur River (entrance)	11 0	9	7
Pulicat Shoals, Coromandel Coast.	9 25	2½		----- (town)	12 20	7	
Pulo Aor, Sumatra, N.E. Coast.		5		Hindoostan, W. C.			
Pulo Condore, China Sea, W. Coast.*	2 30	6½		Rajpuri River (entrance), Hindoostan, W. Coast.	10 40	11	6
Pulo Leat, Gaspar Strait	2 30	4		Ramos R., Bight of Benin	4 20	5	
Pulo Mendanao, Gaspar Strait.	2 30	4		Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Pulo Panjang, G. of Siam	7 0	2		Ramsay Sound, Wales -	6 0	17	
Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½		Ramsey, Isle of Man -	11 12	19½	16
Puluqui Id., Patagonia, W. Coast.	1 5			Ramsgate, England -	11 44	15	12
Puna Island, Ecuador -	6 0	11		Ramso Fiord, Norway -	10 45	7	
Pwlheli, Wales - -	7 46	13½	9½	Rangoon, Bay of Bengal, E. Coast.	5 30	21	14
				----- R. (entrance), B. of Bengal, E. Coast.	3 15	21	14
				Raoul or Sunday Island, S. Pacific.	6 0	5	
				Rappahannock (Saunders Whart), United States.	3 2	2½	2

* From a French survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rás Hafún, Africa, E.C.	6 15	4		Rio Janeiro, Brazil -	3 0	4	3
Rás Jerdaffoon. See Guardafui Cape.				Rio Negro, Patagonia, E. Coast.	11 0	14	
Rás Mohommed (Gulf of Akabah), Red Sea.	6 0	5		Rio Nunez, Africa, West Coast.	10 0	15	11½
Rás Sharmah, Arabia, S.E. Coast.	9 0	8		Ristegouche R., Campbell- town, G. St. Lawrence.	4 0	10	7
Rás-al-Kheimch, Persian Gulf.	11 45	7		Rivadeo, Spain, N. Coast	3 0	15	
Rás-al-Asidah { Arabia } Rás Shébali { S.E. }	8 30	5½		Rivoli B., Australia, S.C.	10 0	4	
Rás-al-Hed { Coast }	10 0	10		Rocas, Atlantic - -	5 15	10	
Rathmullan, Ireland -	9 30	9		Roche Cape, R. St. Law- rence.	9 30	6	4
Ratna-ghiri, Hindoostan, W. Coast.	5 42	12½	9	Roche Harbour, Haro Strait.	irr.	12	
Realejo, Cent. America	10 30	8	6½	Rochefort, France -	4 6	17	13
Reconlavi Inlet, Pata- gonia, W. Coast.	3 6	11		Rochelle, France - -	3 31	17	13
Red Bay, Ceylon, South Coast.	0 44	14		Rockport, United States -	10 57	10½	8
— (Pier), Ireland	2 20	2½		Rockall, N. Atlantic -	3 30	12	
— Labrador -	10 31	4	4	Rocky Id., G. of Siam -	4 0	4	
— Id., Durian Strait -	7 45	3½	1½	Rodrigue Id., Ind. Ocean	1 45	6	
Redbridge, England -	5 0	10½		Roebuck Bay, Australia, W. Coast.	0 30	30	18
Refuge Cove, Bass Strait	{ 10 42 }	{ 8½ }	6	Roji, Hindoostan, W.C.	1 40	18	14
Régueville, France -	{ 12 57 }			Romania Point (Malay Penin.), China Sea, W. Coast.	10 30		
Reikiavik, Iceland -	12 5			Romdals Ids., Norway -	10 45	6	
Rendervous Id., Borneo, S.W. Coast.	6 20	35	26	Rona (South) Light, Scotland.	6 20	14½	10½
— Strait of	5 0	17½	13½	Roodewall Bay, Africa, S.W. Coast.	2 30	6½	
Georgia.	7 0	14		Roque, Cape St., Brazils		10	8
Rendsborg, Denmark -	7 42	4		Roscoff, France - -	4 46	23	17½
Renfrew, R. Clyde, Scot- land -	1 15	9		Rosel, Jersey, English Channel.	6 15	30	21½
Resolution B., Marquesas				Roshnoff Cape, America, N.W. Coast.	7 30	15	
— Port, Tanna Id.	2 30	4		Rota, Spain - -	1 24	12½	8
Reunion Id., { (St. Pierre)	5 35	3		Rotterdam, Netherlands	3 45	7	
Indian O. { (St. Denis)	noon.	3½		Rottneft Id., Australia, W. Coast.	7 50	2½	
Reunion Id., { (St. Gilles)	0 22	2½		Rouen, France - -	2 28		
Indian O. { (St. Paul)	1 0	2½		Rouge Harbour, New- foundland.	7 0?	2-4?	
Rewa Road, Fijii Islands. See Nukulan Port.	1 7	4		Roundstone, Ireland -	4 28	13½	10½
Rhio, Rhio Strait -	10 0	7	5	Rovama River, Africa, E. Coast.	4 0	16	11½
Ribble Lighthouse, Eng- land.	10 51	24	17	Royal Harbour, Ruatan, Bay of Honduras.	7 45	3½	
Richibucto R., Gulf St. Lawrence.	3 30	4	2½	Royal Island, Bahamas -	7 45	3½	
Richmond, United States				Royalist Port, Palawan, E. C.	11 0?	6½?	
— Island, U. S.	4 28	3½	2½	Royan, France - -	3 38	13½	10
— Harb., Prince	11 30	10½	9	Ruapuke Id. (Foveaux St.) New Zealand.	1 0	8	6
Edward Island.	6 0	3	2	Rugged Id., Bahamas -	8 0	3	
— R., Australia, E.C.	9 20			— Nova Scotia	7 59	7½	6
Rio de la Plata, Cape Castillos.*	8 30	2		Ruggles B., Falkland Ids.	7 30	5	
— Buenos	12 0	3-5		Rupon, Hindoostan, W. Coast.	10 30	10	7
Ayres.							
— Barragan	7 0	5-9					
Bay, S. America, E. C.							
Rio Grande do Sul, Brazil.		1½-2					

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rush Port, Ireland -	6 8	5½	3½	San Juan River, New Granada.	6 0	12	
Rutland Id., Ireland, W. Coast.	5 22	11	8	San Lucar, Spain -	1 53	12½	8
Ryde, England -	11 20	13½		San Miguel, California -	9 25	5	4
Rye Bay, England -	11 20	22	17½	San Pedro Anchorage, California.	9 45	4½	3½
Sabine Pass, G. of Mexico		1½		San Rosa Id., California	9 30?	5?	4?
Sable Cape (Clam Point), B. of Fundy.	8 27	8½	6½	Sand Cay, United States	8 40	2	1
—— (Clarkes Harb.), B. of Fundy.	8 58	11	9	Sandalwood Bay, Fijii Ida.	6 0	6?	
Sable Island, N. side, Nova Scotia.	7 30	4		Sand Point, G. of Liautung, Yellow Sea.	4 50	7	5½
Sable Island, S. side, Nova Scotia.	6 30	4		Sands Pnt., United States	11 13	9	7½
Sables d'Olonne, Les, France.	3 26	14	10	Sandwich Port, Malicollo Id., Banks Ids.	5 30	4	
Saboga, New Granada -	4 9	14		Sandy Cape, Australia, E. C.	7 50	6-8	
Sabon Id., Durian Strt. -		10		—— Cove, E., B. of Fundy	10 33	21½	17½
Sacred Bay, Newfoundland	7 23	2½		—— Cove, W., Bay of Fundy.	10 47	23	19
Sacrificios Pnt., Mexico, W. Coast.	3 15	6		—— Hook, United States	7 29	5½	5
Saddle Id., East, China, E. Coast.	11 0	14		—— Id., Madagascar, W. C.	5 0	15	
Sado (Yebisu), Japan Sea	5 0	2		—— Islet, Australia, W. Coast.	10 35	18	
Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8	Sang-tau Bay, Yellow Sea.	0 55	7	4½
Saguenay, Tadousac, G. St. Lawrence.	2 45	17	10	Sanguanga (entrance) Ecuador.	4 10	9	
Saigon (C. St. James) -	11 0	8		Sanguir Island, Moluccas		6	
—— (Saigon City), Cochin China.	5 30	9½		Sangwin R., Africa, W. Cst.	5 15	4	
Saintes, Caribbean Sea -	6 45			Sanmoon Bay (St. George Island), China, E. Coast.	10 20	15	
Sal, C. Verde Id., Africa, W. Coast.	7 45	5		Sannana Bay, Moluccas		9	
Salango Id., Ecuador -	12 41	12		San-shui, Si Kiang, China, E. Coast.		5-6	
Salcombe, England -	5 41	15	11½	Santa Catalina Id., California.	9 35?	5?	4?
Saldanha B., Africa, W. C.	2 0	6		Santa Cruz R., Patagonia, E. Coast.	9 30	40	29
Sale Macowa, Red Sea -	0 30	2		Santa Cruz or Agadir, Africa.	12 45	9	
Salem, United States -	11 13	10½	9	Santa Island, California	9 35?	5?	4?
Salm R., Africa, W. Cst.	8 10	6		—— Tenerife, Canary Is.	1 30	8	
Salmedina Rocks, Spain	1 27	12½	8	Santa Maria Island, Chile	10 20	6	
Salomon Id., S. Pacific	6 45	2		Santander, Spain -	3 30	15	12
Saltash, R. Tamar, England.	5 45	15	11	Santiago de Cuba, Cuba	8 33	2½	
Salt Cay Anchorage, Bahamas.	8 15	4	3	Santona, Spain -	3 30	12½	10½
Saltees, St. George's Channel.	5 40			Saparooa Id., Moluccas -		6	
Salvador, San, Port, Falkland Islands.	8 10	8		Sapie Bay, Sumbawa -	1 0	10	
Samanco B., Peru -	6 30	2		Sarawak R. (Moratabas entr.)	4 0	9	5½
Sambilangs, Malacca St.		12	10½	—— Santubong (entr.)	4 0	10	6
San Francisco (North Beach), California.	12 6	4½	3½	—— Sarawak Junction	5 0	15-18	9
San Bartholomew Port, California.	9 10?	7-9?		—— City -	5 20	15-18	9
San Blas, Mexico, W. C.	9 41	6½		Borneo, W. C.			
San Juan (anchorage), California.	9 40?	5		Sarn Badrig or the Causeway, Wales.	7 30	13	
—— del Sur, Central America.	3 8?	10?		Sarn-y-bwch Reef, Wales	7 40	14	
				Sau-o Bay, Formosa -	10 0	3½	
				Saugor Id., B. of Bengal		12	
				Saumarez Reef, Australia, E. Coast.	8 0	6	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Savannah (city), U. S. -	8 13	7½	6½	Seven Islands Bay, Gulf	1 40	9	
—— (entrance), U.S.	7 20	8	7	St. Lawrence.			8
Scales Point, Blackwater	12 0	14½	10	Sha-lui-tien Banks (west	2 50	10	
River, England.				part), Yellow Sea.			
Scalloway, Shetland -	9 30	5½	4½	Sháb Kadún, Arabia,	9 20	10	
Scarborough, England -	4 11	15½	12½	S.E. Coast.			
—— Shoal, Fili-	11 0	5		Sháb'bu-snifeh, Arabia,	9 45	10	
pinas.				S.E. Coast.			
Scarcies Rivers, Africa,	7 10	10		Shalbet Island, Hindoo-	12 0	9	7
W. Coast.				stan, W. Coast.			
Scarnish, Tiree Id.,	5 31	12	9	Shallow Harb., Falkland	9 30	6	
Scotland.				Ids.			7
Scilly (St. Agnes Id.) -	4 30	16	12	Shanghai, Yang-tse-Kiang,	0 40	10	
—— (St. Mary Id.),	4 18	15½	11½	China, E. Coast.			
England.				Shao-king, Si Kiang,		3	
—— Trescow -	4 22	16½	12½	China, E. Coast.			
Sea Bear Bay, Patagonia,	12 45	20		Sharja, Persian Gulf -	1 0	6	
E. Coast.				Sharks Bay, Naturaliste	11 45	6	
Seaforth Loch, Athline,	6 16	15	10	Channel.			
Scotland.				—— Denham Sd.	12 5	5	
Seaham, England -	3 24	14½	10½	—— Freycinet	3 0	5	
Seal Cove, Grand Manan,	10 54	20	15	Reach.			
B. of Fundy.				—— Freycinet	4 15	3½	
Seal Id., C. Sable, Bay of	9 49	12½	10½	Estuary.			
Fundy.				—— Cape Perron	12 45	5½	
Seamount Bay, Mulroy	6 44	7½		—— Hamelin Pool	5 0	3½	
B., Ireland.				—— Australia,			
Sebastian, San, Brazil -	2 0	4		N.W. Coast			
—— Tierra del Fuego	7 0			Shediac Harbour, New	{ 1 0 }	4	2
Sebastin, Spain, N. Coast	3 0	12	9	Brunswick.	{ 8 0 }		
Sedashigar Bay,* Hin-	10 0	6½	5	Sheephaven, Ireland -	5 32	11½	8½
doostan, W. Coast.				Sheerness, England -	0 37	16	13½
Sedili R., China Sea, W.C.	9 44	7		Sheet Harb., Nova Scotia	8 6	6½	4½
Seer River, Hindoostan,	10 30	11		Shefeen Island, Africa, S.C.	4 40	12	
W. Coast.				Sheffield Island, U. States	10 58	8½	7½
Sein, Isle de, France -	3 21	17½	12	Shelburne, Nova Scotia -	8 4	7	5½
Seleney Bay, Lapland -	7 9	9		Sheldrake Island, Gulf	6 0	5	3
Selsea Bill, England -	11 45	16½	12½	St. Lawrence.			
Semiahmoo Bay, Gulf of	2 0	12		Sherbro R., Africa, W.Cst.	6 0	11	
Georgia, America,				Shields, North, England	3 23	13½	10
N.W. Coast.				Shihtau Bay, Yellow Sea	1 30	9	7
Senegal (Bar) -	8 42	6		Ship Harb., Nova Scotia	7 54	6½	4½
—— (Guet N'dar) -	8 42	6		—— (New Id.),	10 30		
—— (St. Louis), Africa,	10 0	6		Falkland Islands.			
W. Coast.				Shippigan, Gulf St.	3 42	5½	3
Serraia, Hindoostan, W.	1 0	16	13	Lawrence.			
Coast.				Shoal Bay, Australia, N.C.	6 0	18-25	14-20
Serrana Bank Mosquito		2		—— E. Coast -	8 30		
Coast.				Shoal Water B., Australia,	10 30	12-18	
Serranilla Bank, Mosquito	irr.	2		E. Coast.			
Coast.				Shoreham, England -	11 34	18	13½
Sesham Islands, Hang-chu	11 45	14		Shushartie Bay, Vancouver		12	
Bay, China, E. Coast.				Id.			
Setubal, Portugal -	2 30	8	11½	Si Kiang or West River,			
Seudre, River, (entrance,)	3 31	15		China, E. Coast:			
France.				„ (San-shui) -			5-6
Seychelle Archip. (Mayhé	4 0	6½		„ (Shao-king) -			3
Id., Indian Ocean).				„ (Wuchan) -			1-1½
Seypan Id., Ladrone Ids.	6 45	2½		Siak River, Malacca Strt.	9 0	12	
Seven Islands, Lapland -	8 20	12	5	—— off the town -		11	

* Spring tides rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sidmouth Cape, Australia, E. Coast.	9 15	10		Sofala R., Africa, E. Coast	4 0	19	
Sierra Leone, Africa, W.C.	7 55	8		Solitary Ids., Australia, E. Coast.	9 15	5	3
Sillebar R. (Bar), Sumatra	6 0	4½		Solovet Road, White Sea	5 0	4	
Simidsu, Japan Sea -	7 30	7		Solway (Tarn Point), Scotland.	11 22	23	18
Simoda Port, Japan Sea	5 0	3-5		Sooke Harbour, Van- couver Island.	2 0	8	
Simonoseki, Japan Sea -	8 30	8	6	Sosnovaia Bay, White Sea	2 40	6	
Simons Bay, Africa -	2 44	5½	3½	Sosnovets, White Sea -	11 44	18	
Simons St., Island, U.S.	7 43	8½	6½	Souma, White Sea -	6 30	5½	
Simpson Port, N.W. Coast of America.	0 35	21½	14½	South Farallon, California	10 37	4½	3½
Singapore, New Harbour, Malacca Strait.	9 45	10	7½	South Rock, Ireland -	10 58	13	10½
Singoteer Mata, Hindoo- stan, W. Coast.	5 20	24		Southampton, England -	{ 10 30 12 45 }	{ 13 13 }	{ 9½ 9½ }
Sinou, Africa, W. Coast -	5 0	4		South West Bay, New Providence.	7 30	4	
Sir C. Hardy Ids., Torres Strait, E. Coast.	9 15	10		———Cape, N. Zealand	12 0	7	5
Sir E. Pellew Islands, Australia, N. Coast.	7 30	4-7		Southernness, England -	11 20	28	
Sisal, Gulf of Mexico -		2		Southwold, England -	10 20	6½	4½
Sitka, America, N.W.C.*	0 34	5-7		Spain, Port, Trinidad -	4 30	4	3
Skaapen Fiord, Færøe Islands :				Spensers Anchorage, Bay of Fundy.	11 42	39	33
Between Stormoe and Sandoe.	5 0	9½	7½	——— Bay, Africa, S.W. Coast.	10 50	5-6	
Between Hestoe and Sandoe.	5 30	9½	7½	Spenser Gulf, (Thorny Passage,) Australia. S. Coast.	12 0	6-8	
Skagen or the Skaw, Jutland.	5 56	1		——— Point Lowly -	7 0	6-8	
Skerry, Great, E. side, Pentland Firth.	11 4	7¾	6½	——— Port Augusta† -	8 30	9-12	
Skerry, Great, W. side, Pentland Firth,	10 53			——— Point Riley -	5 45	4¾	
Skerries, Ireland, N. Cst.	6 15	5	3	——— Wallaroo -	irr.	4-5	
Skerries, E. Coast. -	11 0	13	10	Sphax Roads, Mediter- ranean.	4 30	5	3
Skip Ness, Scotland -	11 50	9		Spicers Cove, B. of Fundy	11 35	37	30½
Skull, Ireland - -	4 2	9¾	7½	Spider Id., China, E. C. -	10 0	17	
Slaughden, Orford, Eng- land.	1 0	7½		Spitzbergen (Bell Sound)	8 56	3½	
Slievebane Bay Ireland, W. Coast.	5 49	10½	7¾	——— Danes Sound	0 24	5½	
Sligo Bay (Mullaghmore) Ireland.	5 18	11½	8½	Spurn Pt. (Humber R.), England.	5 26	18½	15
——— Harbour, Ireland	5 23	11½	8½	Staten Island, Tierra del Fuego.	4 30	8	
Slyne Hd., Ireland, W.C.	4 30	13½	10	Staunton Id., Yellow Sea	1 30	8	5½
Smalls Lighthouse, St. Georges Channel.	6 0	21		Steilacoom Fort, Oregon	4 46	11	9½
Smerwick, Ireland -	3 50	11½	8	Stephen Port, Australia, E. Coast.	9 0	6	
Smithville, United States	7 19	5½	4¾	——— Falkland Islands.	7 45	7½	
Smoky Bay, Australia, S. Coast.	12 15	6		Stewart Harbour, Tierra del Fuego.	2 50	4	
Smyth Harbour, Tierra del Fuego.	12 0	6½		Stirling, Firth of Forth, Scotland.	3 52	7½	4½
Snape Bridge, Orford, England.	3 0	6		Stirrup Cays, Bahamas -	7 0	4	
Socoa, France - -	3 19	12½	8¾	Stockton (Tees), England	4 40	11	
Society Bay (Sullivan Bay), Yellow Sea.	0 15	8		Stonefield (Loch Etive), Scotland.	7 3		
Socotra Id., Indian Ocean	7 20	8		Stonehaven, Scotland -	1 10	14	11
				Stonington, United States	9 7	3½	3
				Stornoway, Lewis Island, Scotland.	6 46	13	9½

* The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation, (1862,) the local pilots say that the rise sometimes is as much as 16 feet.

† At Port Augusta, when the winds veers round to West and South, and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Strangford (Killard Point), Ireland.	10 53	14	11½	Table Bay, Africa, W. Cst.	2 40	5	
— Quay - -	12 31	10½	8¾	Tabou R., Africa, W. Cst.	4 45	3-4	
— Head of Lough (Turley Rocks).	12 44	11½	9½	Tabuai Island, S. Pacific		3	
Streaky Bay (Blanche- port), Australia S. C.	1 0	5		Tadeo, San, River, Pata- gonia, W. Coast.	11 45	6	
Stroma, S. side, Pentland Firth.	9 47	7½	6	Tahiti, S. Pacific -	noon.	1½	
Stromness, Orkneys -	9 0	10	7½	Tahri, Persian Gulf -	5 0?		
Stuart Channel (Oyster Harbour).	6 0	10		Tai-cho ho, Yellow Sea -	0 15	6	
— Cowitchin		10-12		Taichow Ids., China, E. C.	9 0	14	
Harb., Vancouver Id.				Tai-Tai Bay, China Sea, E. Coast.	9 30	5½	
Stuart Island, Strait of Georgia.	6 0	12-14		Talcahuano, Chile -	10 14	5	
Sturge Narrows, Strait of Georgia.	6 0	12		Talcan Island, Patagonia, W. Coast.	1 3	15½	
Sudiva Atoll, Maldives	1 0	4		Tailung Channel, Canton River, China.	1 30	6½	
Sual Port, Luzon - -		6		Ta-lien-whan Bay, Yel- low Sea.	10 47	10½	8
Sudroe Fiord, Færoe Ids.	6 0	9½	7½	Tama no Ura Harbour, Goto Id., Japan Sea.		6-8	4-6
Suez Bay (head of Gul'f), Red Sea.	2 0	6		Tam-Sui Harbour, China Sea, E. Coast.	11 45	7-12	
Sughrá, Arabia, S.E. Cst.	8 0	6		Tamar R., George Town, Tasmania.	12 5	10	7½
Sumburgh Head, Shetland	9 45			Tamar R., Launceston, Tasmania.	1 0	12½	
Sunday or Raoul Island, S. Pacific.	6 0	5		— Port, Magellan Strait.	3 5	5	
Sunderland, England -	3 22	14½	11	Tamatave, Madagascar, E. Coast.	4 18	8	
— N., England -	2 30	15	11½	Tampa Bay, United States	11 21	1½	1½
Supé Bay, Peru - -	4 50	3		Tanabé, Ki Channel, Japan Sea.	6 0	6	5½
Surat (entrance), Hin- doostan, W. Coast.	2 45	19	15	Tanera, Summer Islands, Scotland.	6 37	14	10½
— (town), Hindoostan, W. Coast.	4 0	19		Tangier, Africa, N. Coast	1 42	8	
Surin, St., France - -	4 11	14½	11	Tangtang Harbour, Mada- gascar, E. Coast.	4 30	6	
Surinam, Guayana -	6 0	5½		Tanjong Api, China Sea		7	
Sussex Port, Falkland Ids.	8 15	6		Tanjong Bolus, Malacca Strait.	9 30	10½	8½
Sutton Pool, England -	5 32	15½	11½	Tanna, New Hebrides -	5 35	3	
Svictoi Nos, Lapland -	9 15	14		Tappahannock, U. States	0 42	2	1½
Svinee Fiord, Færoe Ids.	12 0	6½	4½	Tappanoely Harbour, Su- matra.	6 10	6	
Swain Reefs, Australia E. Coast.	10 25	10		Taranaki or New Ply- mouth, New Zealand.	9 30	12	9
Swan Id., Bass Strait -	9 35	6		Tarbert, Ireland - -	4 57	14½	10½
— Point, Australia, W. Coast.	0 10	26		Tarifa, Spain - -	1 46	6	3½
Swan River, Gage Road	8 50	2½		Tarn Pt., Solway, Scot- land.	11 22	23	18
— Port Grey, Australia, W. Coast.	9 0	1-1½		Tarpaulin Cove, United States.	8 4	2½	2½
Swansea, (Mumbles Lighthouse), Wales.	6 1	27½	20½	Tarrytown, United States	9 57	4	3½
Swatau, China, E. Coast	3 0	9		Tatamagouche, Nova Scotia.	10 0	8	5
Swift Bay, Australia, N. Coast.	12 0	18		Tatuyama Bay, Japan Sea	5 50	5	
Swona, E. side, Pentland Firth.	10 24	10	7½	Tauranga Harbour, New Zealand.	7 10	6	4½
— W. side, Pentland Firth.	9 35	10	7	Tavoy R., (entrance) Bay of Bengal, E. Coast.	10 30	20	
Sydney, Australia, E. Cst.	8 38	4½	4				
Sydney Harb., Cape Breton	9 0	5	4				
Ta-ting ho Yellow Sea -	4 10	10½	8				

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[7012.—2250.—11/66.]

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wilmington, United States	9 6	3	2 $\frac{3}{4}$	Yarmouth Haven (Brush), England.		5 $\frac{3}{4}$	4 $\frac{1}{4}$
Wilson Promontory, Aus- tralia, S. Coast.	2 0	10		Bay of Fundy	10 9	16	13
Winter Harb., Melville Id.	1 30	3 $\frac{3}{4}$		Bridge, England		5	4
Winterton Ness, England	8 25	7 $\frac{3}{4}$	6 $\frac{1}{4}$	Road, England	9 15	6	4 $\frac{1}{2}$
Wisbeach, England	7 30	15		Isle of Wight, England.	{ 10 0 12 0 }	7	6 $\frac{1}{2}$
Wisbeach Eye, England		20		Yealm River, Bigbury Bay, England.	5 37	16 $\frac{1}{4}$	11 $\frac{1}{2}$
Wivenhoe, Colne River, England.	12 10	15	10	Yedo Bay, (Yoku-hama) Japan.	6 0	6 $\frac{1}{2}$	4 $\frac{3}{4}$
Wolstenholm Sound, Arctic Regions.	11 8	7 $\frac{1}{2}$		Yellaboi, Africa, West Coast.	7 10	10	
Woodbridge or Bawdsey Haven (Bar), England. (Kingston Quay), England.	11 45	12	9	Yeu, Ile d', France	3 6	14 $\frac{1}{4}$	10
Woodbridge, (Wilford Bridge), England.	0 35	10		Ylo Road, Peru	8 15	6	
Woodlark Id., Louisiade Archip.	0 55	7		Yoku-hama, Yedo Bay, Japan Sea.	6 0	6 $\frac{1}{2}$	4 $\frac{3}{4}$
Woods Hole (entrance from Vineyard Sound), United States.	7 15	4		York C., Australia, East Coast.	11 15	10	7
(entrance from Buzzard Bay), United States.	8 34	2	1 $\frac{1}{2}$	Factory, Hudson Bay	11 15	10-14	
Woody Island, Australia, E. Coast.	7 59	4 $\frac{3}{4}$	4	River (Moody's Wharf), United States.	9 35	3 $\frac{1}{2}$	
Woolwich, England	9 14	10	7	Road, Magellan St.	2 0	9	
Workington, England	1 37	18 $\frac{1}{2}$	15 $\frac{1}{2}$	Harb., Newfound- land.	10 37	5 $\frac{1}{2}$?	
Workington, England	11 4	20	15	Youghal, Ireland	5 14	12 $\frac{3}{4}$	10
Wrabness, Stour River, England.	12 29	12		Yu-lin-kan Bay, China Sea.	9 5	2 $\frac{1}{4}$	
Wranger Oog, Germany	12 0	9?		Yung R., Chinhae, China, E. Coast.	11 20	12 $\frac{1}{2}$	
Wrath Cape, Scotland	7 30	15 $\frac{1}{2}$		Ning-po-fu, China, E. Coast.	1 0	9	
Wreck Reef, (Bird Islet) Australia, E. Coast.	8 3	6		Yung-hing Bay, Japan S.	5 20	2 $\frac{1}{4}$	
Wuchu, Si Kiang, China, East Coast.		1-1 $\frac{1}{2}$		Yura Harbour, Japan Sea	6 5	6 $\frac{1}{2}$	
Wusung River (entrance), Yang-tse-Kiang, China, E. Coast.	0 30	15	10 $\frac{1}{2}$	Zambezi River (Pearl Id.), Africa, E. Coast.	4 30	12-15	
(Pheasant Point)	0 35	13	8	Zanzibar, Africa, E.C.	5 20	10	
Wykoops Bay, Java	5 0	4 $\frac{1}{2}$	4	(Channel), Africa, E. Coast.	4 15	11	
Yang ho, Yellow Sea	0 15	6		Zaudzi, Mayotta, Comoro Ids.	4 10	12	
Yang-tse Kiang (Light Ship at entrance), China, E. Coast.	12 0	15	10	Zebu Port, Filipinas	12 0	7	
				Zeyla, Africa, E. Coast	7 15	8 $\frac{1}{2}$	
				Zieriksee, Netherlands	2 0	11	9

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TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS,

FOR THE YEAR

1868 ;

ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.

COMPUTED BY STAFF COMMANDER J. BURDWOOD, R.N.

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PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.  
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Price One Shilling and Sixpence.

1867.

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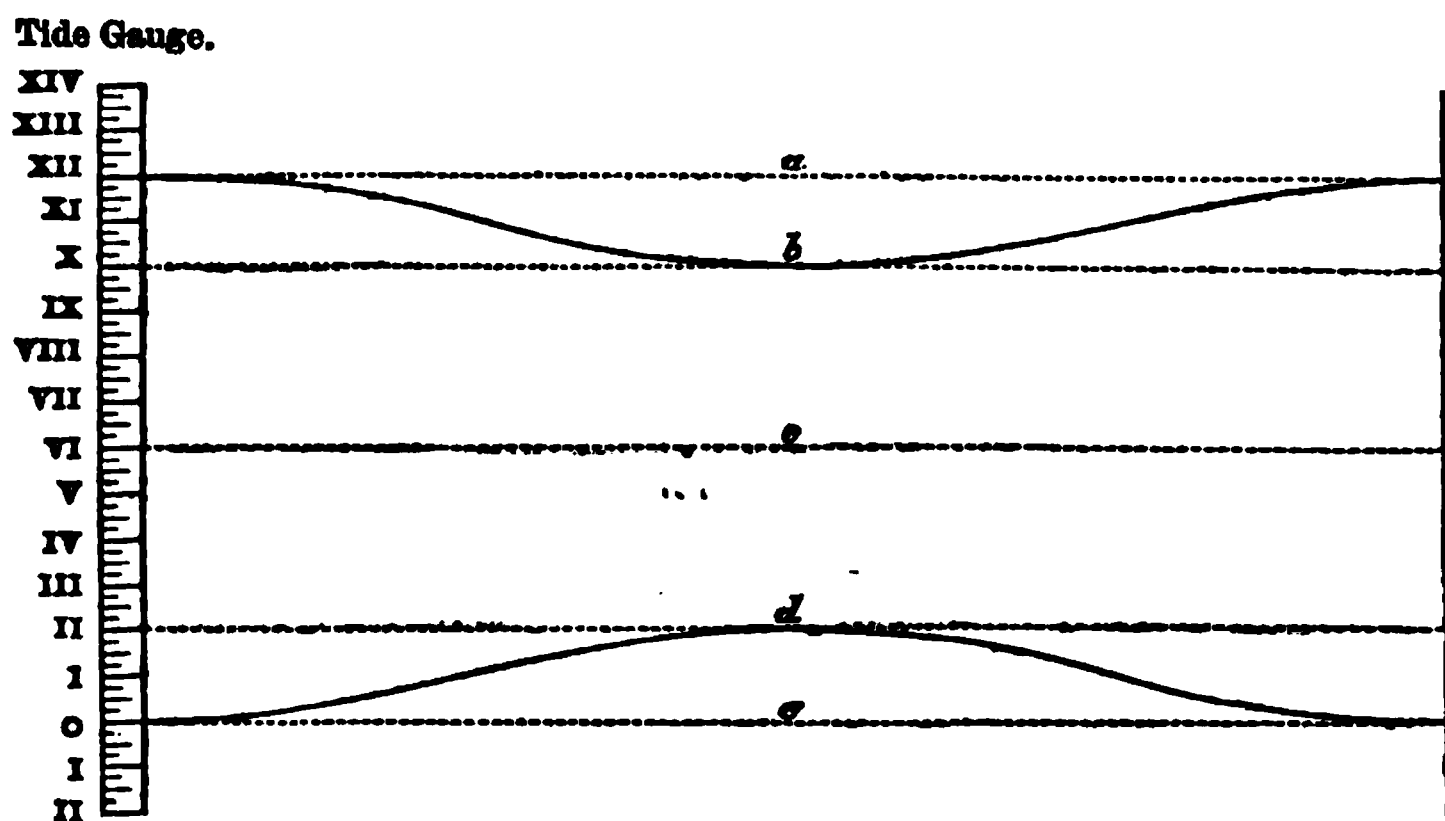
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The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge, the latter being given in these tables, by applying to the times at the docks $+10^m$ and to the heights -4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland, North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke, Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown, Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Malinbegmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Dunannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

Spring Rise (or Mean Spring Range)	=	e to a	=	12	ft.
Neap Rise	-	-	=	e to b	= 10
Neap Range	-	-	=	d to b	= 8

TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS

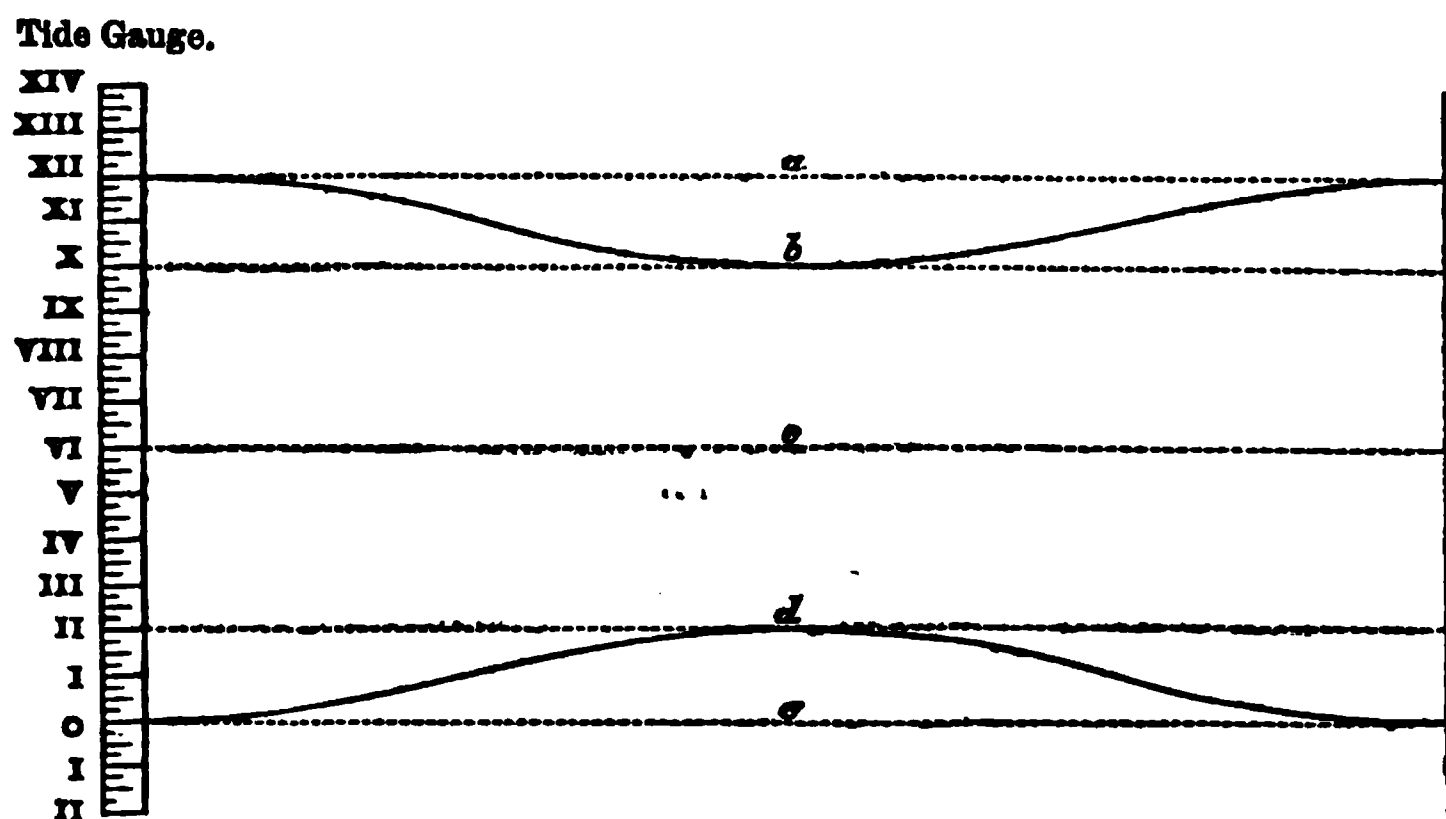
FOR THE YEAR

1868.

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Example.

	ft.
Spring Rise (or Mean Spring Range) = c to a	= 12
Neap Rise = c to b	= 10
Neap Range = d to b	= 8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1868.

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																																																																																																																																																																																																																																																																								
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		H. M.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.																																																																																																																																																																																																																																																																											
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Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																																																																																																																																																																																																																																																																								
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The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

JANUARY, 1868.

WIND. MOON. MORNING DAY.	DOVER.								SHEERNESS.								LONDON.														
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.										
	Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.									
1	2 45	16	6		3 3	16	3		4 12	14	5		4 32	14	3		5 45	17	7		6 5	17	5	6							
2	3 23	16	0		3 45	15	8		4 52	14	0		5 14	13	10		6 20	17	2		6 47	16	11	7							
3	4 8	15	5		4 33	15	1		5 39	13	8		6 5	13	6		7 9	16	9		7 32	16	6								
4	4 59	14	11		5 29	14	10		6 36	13	4		7 8	13	3		8 2	16	4		8 36	16	3	9							
5	5 59	14	10		6 31	15	1		7 45	13	4		8 21	13	5		9 12	16	3		9 46	16	3	10							
6	7 8	15	6		7 44	16	0		8 57	13	8		9 33	14	0		10 22	16	4		10 59	16	7	11							
7	8 16	16	6		8 45	17	1		10 6	14	5		10 35	14	9		11 33	16	10		—	—	—	12							
8	9 13	17	8		9 41	18	2		11 3	15	2		11 29	15	6		0 2	17	3		0 32	17	8	13							
9	10 10	18	8		10 39	19	2		11 55	15	11		—	—	—		1 0	18	1		1 26	18	7	14							
10	11 7	19	6		11 35	19	9		0 21	16	3		0 48	16	6		1 51	19	0		2 17	19	4	15							
11	—	—			0 2	19	10		1 14	16	9		1 39	16	11		2 43	19	9		3 8	20	0	16							
12	0 28	19	11		0 54	19	11		2 4	16	11		2 27	16	11		3 33	20	1		3 56	20	2	17							
13	1 21	19	9		1 47	19	6		2 50	16	10		3 13	16	8		4 20	20	1		4 43	19	11	18							
14	2 12	19	2		2 37	18	9		3 37	16	5		4 1	16	2		5 6	19	9		5 29	19	5	19							
15	3 1	18	2		3 23	17	7		4 25	15	10		4 49	15	5		5 54	19	1		6 17	18	8	20							
16	3 44	17	1		4 6	16	6		5 13	15	0		5 37	14	7		6 41	18	3		7 5	17	9								
17	4 30	15	11		4 55	15	3		6 2	14	2		6 29	13	10		7 30	17	4		7 58	16	11	22							
18	5 24	14	10		5 54	14	7		7 1	13	6		7 36	13	3		8 28	16	6		9 4	16	3	23							
19	6 26	14	5		7 1	14	6		8 15	13	2		8 51	13	3		9 40	16	0		10 15	15	10	24							
20	7 36	14	8		8 11	15	0		9 26	13	4		10 0	13	6		10 53	15	10		11 29	15	11	25							
21	8 43	15	3		9 9	15	8		10 34	13	8		11 3	13	11		—	—	—		0 1	16	1	26							
22	9 34	16	0		9 56	16	3		11 28	14	2		11 50	14	4		0 29	16	3		0 55	16	6	27							
23	10 18	16	7		10 39	16	10		—	—	—		0 11	14	7		1 18	16	10		1 40	17	1	28							
24	10 58	17	1		11 18	17	4		0 30	14	9		0 49	14	11		2 1	17	4		2 20	17	7	29							
25	11 38	17	6		11 55	17	8		1 7	15	1		1 25	15	3		2 37	17	10		2 55	18	1	30							
26	—	—			0 13	17	9		1 42	15	5		1 58	15	6		3 13	18	3		3 29	18	5	31							
27	0 31	17	10		0 49	17	11		2 14	15	6		2 29	15	6		3 44	18	6		3 59	18	7	32							
28	1 7	17	11		1 25	17	11		2 45	15	6		3 1	15	6		4 16	18	7		4 31	18	7	33							
29	1 43	17	10		2 1	17	9		3 16	15	5		3 32	15	4		4 46	18	6		5 2	18	5	34							
30	2 19	17	7		2 38	17	4		3 49	15	2		4 7	15	0		5 20	18	4		5 38	18	2	35							
31	2 58	17	0		3 18	16	9		4 26	14	10		4 46	14	7		5 56	18	0		6 16	17	9	36							
Half Mean Spring } Range.								9ft. 4in.								8ft. 0in.								9ft. 7in.							

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	37	Sub.	9	7	12	Sub.	17	10	12	Sub.	25	12	29	Sub.
2	4	5		10	7	36		18	10	32		26	12	43	
3	4	33		11	8	0		19	10	51		27	12	56	
4	5	0		12	8	24		20	11	9		28	13	8	
5	5	28		13	8	47		21	11	27		29	13	19	
6	5	54		14	9	9		22	11	44		30	13	29	
7	6	21		15	9	31		23	12	0		31	13	39	
8	6	46		16	9	52		24	12	15					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,

DOVER subtract 5 m.

SHEERNESS subtract 8 m.

LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.					
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.		
			Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.	
W.	1	4 ^a 57	3 30	10 4		3 49	10 3		10 8	18 1		10 28	17 10		7 4	12 3		7 24	12 1	
Th.	2	5 42	4 8	10 2		4 28	10 1		10 51	17 6		11 19	17 3		7 46	11 10		8 11	11 8	
F.	3	6 28	4 52	10 0		5 16	9 11		11 47	17 0		—	—		8 37	11 6		9 8	11 4	
S.	4	7 17	5 45	9 10		6 15	9 10		0 20	16 9		0 53	16 8		9 40	11 3		10 15	11 3	
5.	5	8 8	6 52	9 10		7 29	9 11		1 25	16 8		1 57	16 10		10 49	11 4		11 22	11 6	
M.	6	9 4	8 5	10 1		8 40	10 4		2 29	17 2		3 2	17 8		11 55	11 10		—	—	
Tu.	7	10 3	9 13	10 7		9 43	10 10		3 34	18 3		4 4	18 11		0 25	12 3		0 54	12 8	
W.	8	11 5	10 12	11 0		10 39	11 4		4 32	19 6		4 58	20 1		1 22	13 2		1 50	13 7	
Th.	9	morn.	11 6	11 7		11 34	11 10		5 23	20 7		5 49	21 1		2 18	14 0		2 46	14 4	
F.	10	0 8	—	—		0 1	12 0		6 16	21 5		6 44	21 9		3 12	14 8		3 37	15 0	
S.	11	1 11	0 27	12 1		0 52	12 2		7 10	22 1		7 36	22 2		4 1	15 3		4 25	15 4	
5.	12	2 10	1 17	12 2		1 41	12 1		8 0	22 2		8 24	22 1		4 49	15 5		5 13	15 3	
M.	13	3 7	2 5	12 0		2 30	11 10		8 48	21 11		9 12	21 6		5 38	15 0		6 3	14 8	
Tu.	14	4 0	2 54	11 8		3 19	11 6		9 37	21 0		10 1	20 6		6 28	14 4		6 54	13 11	
W.	15	4 50	3 43	11 3		4 6	11 0		10 25	19 11		10 48	19 3		7 19	13 6		7 44	13 1	
Th.	16	5 38	4 28	10 9		4 50	10 7		11 14	18 8		11 43	18 1		8 9	12 8		8 34	12 3	
F.	17	6 26	5 14	10 4		5 40	10 2		—	—		0 14	17 7		9 1	11 11		9 32	11 0	
S.	18	7 12	6 8	10 0		6 42	9 10		0 46	17 0		1 19	16 8		10 7	11 3		10 43	11 1	
5.	19	7 59	7 22	9 9		7 58	9 9		1 52	16 5		2 24	16 5		11 17	11 0		11 50	11 1	
M.	20	8 46	8 33	9 10		9 7	9 11		2 56	16 7		3 29	16 10		—	—		0 21	11 2	
Tu.	21	9 34	9 41	10 1		10 11	10 3		4 2	17 3		4 32	17 7		0 53	11 6		1 22	11 9	
W.	22	10 21	10 37	10 5		11 1	10 6		4 57	17 11		5 19	18 3		1 47	12 0		2 12	12 3	
Th.	23	11 9	11 23	10 8		11 43	10 10		5 40	18 7		5 59	18 10		2 35	12 6		2 54	12 8	
F.	24	11 56	—	—		0 2	10 11		6 18	19 0		6 37	19 3		3 13	12 11		3 31	13 1	
S.	25	0 ^a 42	0 20	11 0		0 37	11 1		6 56	19 6		7 13	19 8		3 48	13 4		4 5	13 6	
5.	26	1 27	0 54	11 1		1 11	11 2		7 30	19 10		7 47	19 11		4 21	13 8		4 37	13 9	
M.	27	2 12	1 28	11 2		1 44	11 1		8 3	20 0		8 18	20 0		4 52	13 9		5 8	13 9	
Tu.	28	2 56	2 0	11 1		2 16	11 0		8 34	20 0		8 51	19 11		5 24	13 8		5 41	13 7	
W.	29	3 40	2 33	11 0		2 50	10 11		9 8	19 9		9 26	19 6		5 59	13 5		6 17	13 3	
Th.	30	4 25	3 7	10 10		3 25	10 9		9 43	19 3		10 1	18 11		6 35	13 0		6 56	12 10	
F.	31	5 11	3 44	10 8		4 3	10 6		10 21	18 7		10 42	18 3		7 17	12 8		7 38	12 5	
Half Mean Spring } Range.			5ft. 9in.						10ft. 5in.						7ft. 2in.					
Phases of the Moon.										Moon's Declination at Noon.										
D. H. M.										M.D. ° ' "										
First Quarter - 3 4 3 Morning.										1 4 8.40 9 18 N.46 17 9 8.17 25 15 8.9										
Full - - - - 9 10 53 Afternoon.										2 0 42 10 17 33 18 12 36 26 12 31										
Last Quarter - 16 5 4 Afternoon.										3 3 N.24 11 15 5 19 15 18 27 9 10										
New - - - - 24 7 18 Afternoon.										4 7 28 12 11 38 20 17 16 28 5 45										
In Perigee - - 10 2 0 Morning.										5 11 18 13 7 33 21 18 28 29 1 52										
In Apogee - - 23 7 0 Afternoon.										6 14 38 14 3 9 22 18 51 30 2 N.9										
										7 17 10 15 1 S.15 23 18 24 31 6 9										
										8 18 37 16 5 28 24 17 9										

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
W.	1	7 4	11 3	7 26	11 0	6 1	14 0	6 23	13 9	—	—	0 14	10 7	6.5
Th.	2	7 50	10 9	8 16	10 6	6 46	13 6	7 12	13 3	0 38	10 4	1 3	10 2	7.5
F.	3	8 44	10 3	9 17	10 2	7 39	13 1	8 11	12 11	1 29	10 0	2 1	9 10	8
S.	4	9 51	10 2	10 26	10 2	8 44	12 10	9 21	12 10	2 35	9 9	3 14	9 9	9.5
S.	5	11 0	10 4	11 34	10 7	9 55	13 0	10 29	13 3	3 52	9 10	4 28	10 0	10.5
M.	6	—	—	0 8	10 11	11 2	13 6	11 32	13 10	5 3	10 3	5 34	10 6	11.5
Tu.	7	0 39	11 3	1 6	11 7	12 0	14 3	—	—	6 2	11 0	6 27	11 6	12.5
W.	8	1 32	11 11	1 57	12 4	0 26	14 9	0 51	15 3	6 50	12 1	7 13	12 8	13.5
Th.	9	2 22	12 10	2 47	13 3	1 17	15 10	1 44	16 4	7 36	13 3	7 59	13 9	14.5
F.	10	3 12	13 7	3 37	13 11	2 10	16 9	2 35	17 1	8 23	14 1	8 47	14 3	15.5
S.	11	4 2	14 1	4 27	14 2	2 59	17 3	3 23	17 4	9 12	14 3	9 36	14 3	16.5
S.	12	4 51	14 1	5 16	13 11	3 47	17 3	4 11	17 11	10 1	14 1	10 26	13 10	17.5
M.	13	5 41	13 9	6 7	13 6	4 36	16 10	5 1	16 7	10 52	13 6	11 18	13 1	18.5
Tu.	14	6 32	13 3	6 57	12 10	5 26	16 3	5 52	15 11	11 44	12 8	—	—	19.5
W.	15	7 22	12 6	7 47	12 0	6 18	15 5	6 44	14 11	0 10	12 3	0 35	11 9	20.5
Th.	16	8 13	11 7	8 40	11 1	7 9	14 5	7 35	13 11	1 0	11 3	1 27	10 10	21.5
F.	17	9 10	10 8	9 43	10 4	8 4	13 6	8 36	13 1	1 55	10 6	2 27	10 1	22.5
S.	18	10 20	10 2	10 55	10 1	9 12	12 10	9 50	12 8	3 4	9 9	3 45	9 7	23.5
S.	19	11 29	10 1	—	—	10 24	12 8	10 56	12 8	4 21	9 5	4 56	9 5	24.5
M.	20	0 3	10 2	0 35	10 3	11 28	12 9	12 0	13 0	5 29	9 5	6 2	9 7	25.5
Tu.	21	1 6	10 5	1 34	10 7	—	—	0 28	13 3	6 30	9 11	6 52	10 4	26.5
W.	22	1 57	10 10	2 19	11 1	0 51	13 6	1 13	13 10	7 11	10 8	7 30	11 1	27.5
Th.	23	2 39	11 4	2 57	11 7	1 34	14 3	1 54	14 6	7 46	11 5	8 2	11 9	28.5
F.	24	3 14	11 10	3 31	12 0	2 12	14 10	2 30	15 1	8 18	12 1	8 35	12 3	29.5
S.	25	3 48	12 2	4 5	12 4	2 47	15 3	3 3	15 5	8 51	12 4	9 6	12 5	30.5
S.	26	4 21	12 6	4 38	12 6	3 18	15 6	3 34	15 6	9 22	12 6	9 39	12 6	31.5
M.	27	4 54	12 6	5 11	12 6	3 50	15 6	4 6	15 5	9 56	12 5	10 13	12 4	32.5
Tu.	28	5 28	12 5	5 45	12 4	4 23	15 4	4 40	15 3	10 30	12 3	10 47	12 1	33.5
W.	29	6 2	12 3	6 20	12 1	4 57	15 2	5 15	15 11	11 5	11 11	11 25	11 9	34.5
Th.	30	6 38	12 0	6 57	11 10	5 34	14 11	5 54	14 8	11 46	11 6	—	—	35.5
F.	31	7 18	11 7	7 40	11 4	6 15	14 5	6 37	14 1	0 7	11 3	0 29	11 0	36.5
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	37		9	7	12		17	10	12		25	12	29	
2	4	5		10	7	36		18	10	32		26	12	43	
3	4	33		11	8	0		19	10	51		27	12	56	
4	5	0		12	8	24		20	11	9		28	13	8	
5	5	28		13	8	47		21	11	27		29	13	19	
6	5	54		14	9	9		22	11	44		30	13	29	
7	6	21		15	9	31		23	12	0		31	13	39	
8	6	46		16	9	52		24	12	15					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

TIDE TABLES FOR THE

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		H. M.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
W.	1	4 57	2 15	8 8	2 38	8 7	11 41	6 1	—	—	8 57	9 0	9 23	8 10
Th.	2	5 42	3 1	8 6	3 26	8 5	0 8	5 11	0 40	5 9	9 50	8 8	10 19	8 7
F.	3	6 28	3 52	8 4	4 22	8 3	1 13	5 8	1 51	5 8	10 52	8 6	11 26	8 6
S.	4	7 17	4 53	8 3	5 26	8 2	2 28	5 9	3 4	5 10	12 0	8 7	—	—
♄.	5	8 8	5 59	8 2	6 32	8 3	3 36	6 0	4 6	6 3	0 33	8 8	1 6	8 10
M.	6	9 4	7 8	8 3	7 40	8 5	4 35	6 6	5 1	6 9	1 41	9 0	2 13	9 1
Tu.	7	10 3	8 9	8 7	8 35	8 10	5 24	6 11	5 47	7 1	2 41	9 8	3 6	10 0
W.	8	11 5	9 1	9 1	9 27	9 4	6 11	7 4	6 37	7 7	3 30	10 4	3 54	10 8
Th.	9	morn.	9 53	9 6	10 19	9 8	7 5	7 9	7 32	7 11	4 19	11 2	4 45	11 0
F.	10	0 8	10 44	9 9	11 9	9 10	7 59	8 1	8 23	8 3	5 12	11 9	5 38	11 11
S.	11	1 11	11 33	9 10	11 55	9 10	8 46	8 3	9 8	8 3	6 3	12 0	6 26	11 11
♄.	12	2 10	—	—	0 20	9 9	9 30	8 1	9 53	7 11	6 50	11 9	7 15	11 1
M.	13	3 7	0 46	9 8	1 12	9 7	10 16	7 9	10 40	7 7	7 39	11 3	8 4	10 1
Tu.	14	4 0	1 38	9 6	2 5	9 4	11 4	7 4	11 31	7 0	8 28	10 7	8 53	10 1
W.	15	4 50	2 32	9 2	2 58	9 0	—	—	0 1	6 9	9 18	9 10	9 45	9 1
Th.	16	5 38	3 23	8 10	3 49	8 8	0 33	6 5	1 6	6 2	10 14	9 2	10 45	8 1
F.	17	6 26	4 16	8 6	4 47	8 4	1 40	6 0	2 20	5 10	11 18	8 8	11 53	8 1
S.	18	7 12	5 20	8 2	5 53	8 1	2 57	5 9	3 31	5 10	—	—	0 27	8 1
♄.	19	7 59	6 26	8 0	7 2	8 0	4 2	5 11	4 32	6 0	1 1	8 5	1 35	8 1
M.	20	8 46	7 35	8 0	8 8	8 1	4 59	6 1	5 25	6 3	2 8	8 6	2 41	8 1
Tu.	21	9 34	8 36	8 3	9 0	8 5	5 50	6 4	6 11	6 5	3 8	8 10	3 31	9 1
W.	22	10 21	9 22	8 7	9 43	8 9	6 32	6 7	6 53	6 8	3 51	9 4	4 10	9 1
Th.	23	11 9	10 2	8 10	10 21	8 11	7 13	6 9	7 33	6 11	4 28	9 10	4 47	10 1
F.	24	11 56	10 39	9 0	10 56	9 1	7 52	7 0	8 10	7 1	5 5	10 3	5 24	10 1
S.	25	0 42	11 12	9 1	11 28	9 2	8 26	7 2	8 41	7 3	5 42	10 7	5 58	10 1
♄.	26	1 27	11 43	9 2	11 58	9 2	8 55	7 4	9 10	7 3	6 13	10 8	6 29	10 1
M.	27	2 12	—	—	0 15	9 2	9 25	7 3	9 41	7 2	6 45	10 8	7 2	10 1
Tu.	28	2 56	0 32	9 2	0 49	9 2	9 56	7 1	10 12	7 0	7 19	10 5	7 36	10 1
W.	29	3 30	1 7	9 1	1 26	9 1	10 29	6 11	10 47	6 9	7 53	10 1	8 9	9 1
T.	30	4 25	1 46	9 0	2 7	8 11	11 6	6 8	11 29	6 6	8 28	9 8	8 49	9 1
F.	31	5 11	2 29	8 10	2 52	8 9	11 55	6 3	—	—	9 11	9 3	9 37	9 1

Half Mean Spring
Range.

4 ft. 9 in.

3 ft. 10 in.

5 ft. 7 in.

Phases of the Moon.

	D.	H.	M.	
First Quarter-	3	4	3	Morning.
Full - - - -	9	10	53	Afternoon.
Last Quarter-	16	5	4	Afternoon.
New - - - -	24	7	18	Afternoon.

In Perigee - -	10	2	0	Morning.
In Apogee - -	23	7	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	48	40	9	18	N. 46	17	9	S. 17	25	13	S. 9
2	0	42	10	17	33	18	12	36	26	12	31
3	3	N. 24	11	15	5	19	15	18	27	9	20
4	7	38	12	11	38	20	17	16	28	5	45
5	11	18	13	7	33	21	18	28	29	1	34
6	14	38	14	3	9	22	18	51	30	2	N. 9
7	17	10	15	13	15	23	18	24	31	6	9
8	18	37	16	5	28	24	17	9			

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —

BELFAST subtract 2 m.

LONDONDERRY add 4 m.

SLIGO BAY add 9 m.

BRITISH AND IRISH PORTS.

7

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. P. I.		H. M. P. I.	H. M. P. I.		H. M. P. I.		H. M. P. I.	H. M. P. I.		H. M. P. I.		D.
W.	1	10 17 32	3	10 34 31	8	1 35 13	10	1 56 13	8	2 34 9	7	2 55 9	6	6.5
Th.	2	10 53 31	4	11 14 30	5	2 18 13	5	2 43 13	3	3 17 9	5	3 42 9	3	7.5
F.	3	11 40 29	11	—	—	3 11 13	1	3 43 12	11	4 9 9	2	4 40 9	0	9
S.	4	0 8 29	7	0 41 29	5	4 17 12	10	4 54 12	11	5 12 9	0	5 45 9	0	9.5
D.	5	1 15 29	7	1 51 29	11	5 28 13	1	6 2 13	4	6 17 9	1	6 50 9	3	10.5
M.	6	2 29 30	7	3 53 31	5	6 36 13	7	7 6 13	11	7 23 9	6	7 54 9	8	11.5
Tu.	7	3 41 32	5	4 16 33	6	7 34 14	4	8 1 14	9	8 25 9	11	8 55 10	2	12.5
W.	8	4 50 34	9	5 21 35	11	8 27 15	3	8 52 15	8	9 24 10	5	9 51 10	8	13.5
Th.	9	5 51 37	1	6 21 37	11	9 17 16	1	9 43 16	5	10 16 10	11	10 41 11	2	14.5
F.	10	6 49 38	8	7 16 39	3	10 8 16	9	10 32 16	11	11 5 11	4	11 30 11	6	15.5
S.	11	7 42 39	8	8 6 39	9	10 55 17	0	11 18 17	0	11 55 11	6	—	—	16.5
D.	12	8 29 39	8	8 52 39	4	11 41 16	11	—	—	0 20 11	6	0 45 11	5	17.5
M.	13	9 15 38	10	9 37 38	2	0 6 16	9	0 33 16	5	1 10 11	3	1 36 11	1	18.5
Tu.	14	9 58 37	2	10 18 36	2	1 0 16	1	1 26 15	8	2 1 10	10	2 26 10	7	19.5
W.	15	10 36 35	0	10 54 33	10	1 51 15	3	2 16 14	10	2 51 10	5	3 15 10	2	20.5
Th.	16	11 14 32	7	11 36 31	5	2 41 14	4	3 7 13	11	3 40 9	11	4 6 9	8	21.5
F.	17	—	—	0 2 30	4	3 36 13	6	4 8 13	1	4 34 9	5	5 6 9	2	22.5
S.	18	0 35 29	6	1 9 28	11	4 45 12	10	5 23 12	9	5 39 9	0	6 12 8	11	23.5
D.	19	1 44 28	8	2 20 28	7	5 57 12	9	6 30 12	9	6 44 8	11	7 16 9	0	24.5
M.	20	2 57 28	10	3 36 29	3	7 2 12	10	7 34 13	0	7 48 9	1	8 22 9	2	25.5
Tu.	21	4 11 29	10	4 42 30	7	8 2 13	3	8 26 13	6	8 53 9	4	9 20 9	6	26.5
W.	22	5 11 31	5	5 37 32	2	8 48 13	10	9 8 14	1	9 45 9	8	10 8 9	9	27.5
Th.	23	5 59 32	9	6 21 33	4	9 27 14	3	9 45 14	6	10 26 9	11	10 43 10	1	28.5
F.	24	6 42 33	11	7 1 34	4	10 3 14	9	10 20 14	11	11 0 10	3	11 17 10	4	29.5
S.	25	7 19 34	9	7 36 35	3	10 36 15	0	10 50 15	2	11 33 10	5	11 49 10	6	30.5
D.	26	7 52 35	6	8 8 35	8	11 5 15	3	11 20 15	3	—	—	0 6 10	6	31.5
M.	27	8 24 35	9	8 40 35	9	11 36 15	3	11 53 15	3	0 23 10	6	0 40 10	6	32.5
Tu.	28	8 55 35	8	9 11 35	6	—	—	0 11 15	2	0 57 10	5	1 14 10	5	33.5
W.	29	9 27 35	3	9 43 34	11	0 29 15	1	0 48 14	11	1 31 10	4	1 49 10	2	34.5
Th.	30	9 59 34	5	10 15 33	10	1 7 14	9	1 27 14	6	2 7 10	1	2 27 10	0	35.5
F.	31	10 31 33	2	10 48 32	5	1 48 14	3	2 10 14	0	2 48 9	10	3 9 9	8	36.5
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 37	Sub.	9	7 12	Sub.	17	10 12	Sub.	25	12 29	Sub.
2	4 5		10	7 36		18	10 32		26	12 43	
3	4 33		11	8 0		19	10 51		27	12 56	
4	5 0		12	8 24		20	11 9		28	13 8	
5	5 28		13	8 47		21	11 27		29	13 19	
6	5 54		14	9 9		22	11 44		30	13 29	
7	6 21		15	9 31		23	12 0		31	13 39	
8	6 46		16	9 52		24	12 15				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	4 57	2 15	8 8	2 38	8 7	11 41	6 1	—	—	8 57	9 0	9 22	8 10
Th.	2	5 42	3 1	8 6	3 26	8 5	0 8	5 11	0 40	5 9	9 50	8 8	10 19	8 7
F.	3	6 28	3 52	8 4	4 22	8 3	1 13	5 8	1 51	5 8	10 52	8 6	11 26	8 6
S.	4	7 17	4 53	8 3	5 26	8 2	2 28	5 9	3 4	5 10	12 0	8 7	—	—
S.	5	8 8	5 59	8 2	6 32	8 3	3 36	6 0	4 6	6 3	0 33	8 8	1 6	8 10
M.	6	9 4	7 8	8 3	7 40	8 5	4 35	6 6	5 1	6 9	1 41	9 0	2 13	9 3
Tu.	7	10 3	8 9	8 7	8 35	8 10	5 24	6 11	5 47	7 1	2 41	9 8	3 6	10 0
W.	8	11 5	9 1	9 1	9 27	9 4	6 11	7 4	6 37	7 7	3 30	10 4	3 54	10 9
Th.	9	morn.	9 53	9 6	10 19	9 8	7 5	7 9	7 32	7 11	4 19	11 2	4 45	11 6
F.	10	0 8	10 44	9 9	11 9	9 10	7 59	8 1	8 23	8 3	5 12	11 9	5 38	11 11
S.	11	1 11	11 33	9 10	11 55	9 10	8 46	8 3	9 8	8 3	6 3	12 0	6 26	11 11
S.	12	2 10	—	—	0 20	9 9	9 30	8 1	9 53	7 11	6 50	11 9	7 15	11 7
M.	13	3 7	0 46	9 8	1 12	9 7	10 16	7 9	10 40	7 7	7 39	11 3	8 4	10 11
Tu.	14	4 0	1 38	9 6	2 5	9 4	11 4	7 4	11 31	7 0	8 28	10 7	8 55	10 2
W.	15	4 50	2 32	9 2	2 58	9 0	—	—	0 1	6 9	9 18	9 10	9 45	9 6
Th.	16	5 38	3 23	8 10	3 49	8 8	0 33	6 5	1 6	6 2	10 14	9 2	10 45	8 11
F.	17	6 26	4 16	8 6	4 47	8 4	1 40	6 0	2 20	5 10	11 18	8 8	11 53	8 6
S.	18	7 12	5 20	8 2	5 53	8 1	2 57	5 9	3 31	5 10	—	—	0 27	8 5
S.	19	7 59	6 26	8 0	7 2	8 0	4 2	5 11	4 32	6 0	1 1	8 5	1 35	8 5
M.	20	8 46	7 35	8 0	8 8	8 1	4 59	6 1	5 25	6 3	2 8	8 6	2 41	8 8
Tu.	21	9 34	8 36	8 3	9 0	8 5	5 50	6 4	6 11	6 5	3 8	8 10	3 31	9 1
W.	22	10 21	9 22	8 7	9 43	8 9	6 32	6 7	6 53	6 8	3 51	9 4	4 10	9 7
Th.	23	11 9	10 2	8 10	10 21	8 11	7 13	6 9	7 33	6 11	4 28	9 10	4 47	10 0
F.	24	11 56	10 39	9 0	10 56	9 1	7 52	7 0	8 10	7 1	5 5	10 3	5 24	10 5
S.	25	0 42	11 12	9 1	11 28	9 2	8 26	7 2	8 41	7 3	5 42	10 7	5 58	10 8
S.	26	1 27	11 43	9 2	11 58	9 2	8 55	7 4	9 10	7 3	6 13	10 8	6 29	10 8
M.	27	2 12	—	—	0 15	9 2	9 25	7 3	9 41	7 2	6 45	10 8	7 2	10 6
Tu.	28	2 56	0 32	9 2	0 49	9 2	9 56	7 1	10 12	7 0	7 19	10 5	7 36	10 3
W.	29	3 30	1 7	9 1	1 26	9 1	10 29	6 11	10 47	6 9	7 53	10 1	8 9	9 11
T.	30	4 25	1 46	9 0	2 7	8 11	11 6	6 8	11 29	6 6	8 28	9 8	8 49	9 6
F.	31	5 11	2 29	8 10	2 52	8 9	11 55	6 3	—	—	9 11	9 3	9 37	9 1

Half Mean Spring }
Range. } 4 ft. 9 in.

3 ft. 10 in.

5 ft. 7 in.

Phases of the Moon.

	D.	H.	M.	
First Quarter-	3	4	3	Morning.
Full - - - -	9	10	53	Afternoon.
Last Quarter-	16	5	4	Afternoon.
New - - - -	24	7	18	Afternoon.
In Perigee - -	10	2	0	Morning.
In Apogee - -	23	7	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	48.40		9	18 N.46		17	9 S.17		25	15 S.9	
2	0 42		10	17 33		18	12 36		26	12 31	
3	3 N.24		11	15 5		19	15 18		27	9 20	
4	7 28		12	11 38		20	17 16		28	5 45	
5	11 18		13	7 33		21	18 28		29	1 52	
6	14 38		14	3 9		22	18 51		30	2 N.9	
7	17 10		15	18.15		23	18 24		31	6 9	
8	18 37		16	5 28		24	17 9				

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D
W.	1	8	20	12	2	8	42	11	10	8	36	10	1	8	55	9	11	8	53	11	1	9	11	10	11	6.5
Th.	2	9	6	11	7	9	31	11	4	9	17	9	9	9	39	9	7	9	32	10	9	9	55	10	7	7.5
F.	3	10	2	11	2	10	34	11	1	10	5	9	5	10	32	9	4	10	25	10	4	10	55	10	3	8
S.	4	11	9	11	2	11	44	11	4	11	6	9	4	11	41	9	5	11	27	10	2	11	59	10	1	9.5
S.	5	—	—	—	—	0	19	11	6	—	—	—	—	0	16	9	6	—	—	—	—	0	30	10	3	10.5
M.	6	0	53	11	10	1	24	12	3	0	53	9	9	1	29	10	0	1	4	10	5	1	38	10	8	11.5
Tu.	7	1	52	12	9	2	19	13	3	2	3	10	3	2	34	10	7	2	12	11	0	2	46	11	5	12.5
W.	8	2	46	13	9	3	13	14	2	3	4	10	11	3	32	11	4	3	19	11	9	3	50	12	1	13.5
Th.	9	3	39	14	8	4	6	15	1	4	0	11	8	4	28	12	0	4	21	12	5	4	51	12	8	14.5
F.	10	4	32	15	6	4	57	15	9	4	55	12	3	5	22	12	5	5	18	12	10	5	44	13	0	15.5
S.	11	5	22	15	11	5	46	16	0	5	48	12	6	6	13	12	6	6	9	13	2	6	33	13	3	16.5
S.	12	6	11	15	10	6	36	15	7	6	37	12	6	7	2	12	4	6	58	13	2	7	22	13	1	17.5
M.	13	7	1	15	4	7	26	15	0	7	26	12	2	7	50	11	11	7	46	13	0	8	10	12	9	18.5
Tu.	14	7	51	14	6	8	16	14	1	8	13	11	7	8	35	11	3	8	33	12	6	8	54	12	3	19.5
W.	15	8	40	13	5	9	5	12	10	8	56	10	11	9	17	10	7	9	13	11	11	9	32	11	7	20.5
Th.	16	9	30	12	3	9	55	11	10	9	39	10	2	10	1	9	11	9	53	11	3	10	18	10	10	21.5
F.	17	10	26	11	5	11	1	11	2	10	27	9	7	11	0	9	4	10	49	10	5	11	21	10	2	22.5
S.	18	11	38	11	0	—	—	—	—	11	35	9	2	—	—	—	—	11	53	9	11	—	—	—	—	23.5
S.	19	0	13	10	11	0	47	10	11	0	10	9	1	0	46	9	1	0	25	9	10	0	58	9	10	24.5
M.	20	1	20	11	1	1	52	11	4	1	22	9	2	1	59	9	4	1	32	9	11	2	7	10	1	25.5
Tu.	21	2	19	11	7	2	43	11	11	2	32	9	6	2	59	9	9	2	42	10	3	3	12	10	6	26.5
W.	22	3	7	12	2	3	29	12	5	3	25	9	11	3	48	10	2	3	40	10	8	4	6	10	11	27.5
Th.	23	3	48	12	8	4	7	12	11	4	9	10	4	4	30	10	6	4	28	11	1	4	50	11	3	28.5
F.	24	4	25	13	3	4	43	13	6	4	49	10	9	5	7	10	11	5	11	11	5	5	30	11	6	29.5
S.	25	4	59	13	8	5	16	13	11	5	25	11	0	5	43	11	2	5	47	11	8	6	2	11	9	30.5
S.	26	5	33	14	0	5	49	14	1	6	0	11	2	6	16	11	3	6	20	11	10	6	36	11	11	31.5
M.	27	6	6	14	1	6	23	14	0	6	32	11	3	6	49	11	3	6	53	12	0	7	10	12	0	32.5
Tu.	28	6	39	13	11	6	56	13	10	7	5	11	2	7	21	11	1	7	26	12	0	7	43	12	0	33.5
W.	29	7	14	13	8	7	32	13	5	7	38	11	0	7	56	10	11	8	0	11	11	8	16	11	10	34.5
Th.	30	7	52	13	3	8	13	12	11	8	14	10	9	8	32	10	7	8	33	11	8	8	50	11	6	35.5
F.	31	8	34	12	7	8	57	12	2	8	50	10	4	9	10	10	1	9	7	11	4	9	26	11	2	36.5

Half Mean Spring } Range.	7ft. 5in.	5ft 10in.	6ft. 2in.
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Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	3 37	Sub.	9	7 12	Sub.	17	10 12	Sub.	25	12 29	Sub.
2	4 5		10	7 36		18	10 32		26	12 43	
3	4 33		11	8 0		19	10 51		27	12 56	
4	5 0		12	8 24		20	11 9		28	13 8	
5	5 28		13	8 47		21	11 27		29	13 19	
6	5 54		14	9 9		22	11 44		30	13 29	
7	6 21		15	9 31		23	12 0		31	13 39	
8	6 46		16	9 52		24	12 15				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.	
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
W.	1	48 57	2	15	8	8	2	38	8	7	11	41	6	1	—	—	—	—	8	57	9	0	9	22	8	10
Th.	2	5 42	3	1	8	6	3	26	8	5	0	8	5	11	0	40	5	9	9	50	8	8	10	19	8	7
F.	3	6 28	3	52	8	4	4	22	8	3	1	13	5	8	1	51	5	8	10	52	8	6	11	26	8	6
S.	4	7 17	4	53	8	3	5	26	8	2	2	28	5	9	3	4	5	10	12	0	8	7	—	—	—	—
S.	5	8 8	5	59	8	2	6	32	8	3	3	36	6	0	4	6	6	3	0	33	8	8	1	6	8	10
M.	6	9 4	7	8	8	3	7	40	8	5	4	35	6	6	5	1	6	9	1	41	9	0	2	13	9	3
Tu.	7	10 3	8	9	8	7	8	35	8	10	5	24	6	11	5	47	7	1	2	41	9	8	3	6	10	0
W.	8	11 5	9	1	9	1	9	27	9	4	6	11	7	4	6	37	7	7	3	30	10	4	3	54	10	9
Th.	9	morn.	9	53	9	6	10	19	9	8	7	5	7	9	7	32	7	11	4	19	11	2	4	45	11	6
F.	10	0 8	10	44	9	9	11	9	9	10	7	59	8	1	8	23	8	3	5	12	11	9	5	38	11	11
S.	11	1 11	11	33	9	10	11	55	9	10	8	46	8	3	9	8	8	3	6	3	12	0	6	26	11	11
S.	12	2 10	—	—	—	—	0	20	9	9	9	30	8	1	9	53	7	11	6	50	11	9	7	15	11	7
M.	13	3 7	0	46	9	8	1	12	9	7	10	16	7	9	10	40	7	7	7	39	11	3	8	4	10	11
Tu.	14	4 0	1	38	9	6	2	5	9	4	11	4	7	4	11	31	7	0	8	28	10	7	8	53	10	2
W.	15	4 50	2	32	9	2	2	58	9	0	—	—	—	—	0	1	6	9	9	18	9	10	9	45	9	6
Th.	16	5 38	3	23	8	10	3	49	8	8	0	33	6	5	1	6	6	2	10	14	9	2	10	45	8	11
F.	17	6 26	4	16	8	6	4	47	8	4	1	40	6	0	2	20	5	10	11	18	8	8	11	53	8	6
S.	18	7 12	5	20	8	2	5	53	8	1	2	57	5	9	3	31	5	10	—	—	—	—	0	27	8	5
S.	19	7 59	6	26	8	0	7	2	8	0	4	2	5	11	4	32	6	0	1	1	8	5	1	35	8	5
M.	20	8 46	7	35	8	0	8	8	8	1	4	59	6	1	5	25	6	3	2	8	8	6	2	41	8	8
Tu.	21	9 34	8	36	8	3	9	0	8	5	5	50	6	4	6	11	6	5	3	8	8	10	3	31	9	1
W.	22	10 21	9	22	8	7	9	43	8	9	6	32	6	7	6	53	6	8	3	51	9	4	4	10	9	7
Th.	23	11 9	10	2	8	10	10	21	8	11	7	13	6	9	7	33	6	11	4	28	9	10	4	47	10	0
F.	24	11 56	10	39	9	0	10	56	9	1	7	52	7	0	8	10	7	1	5	5	10	3	5	24	10	5
S.	25	0 42	11	12	9	1	11	28	9	2	8	26	7	2	8	41	7	3	5	42	10	7	5	58	10	8
S.	26	1 27	11	43	9	2	11	58	9	2	8	55	7	4	9	10	7	3	6	13	10	8	6	29	10	8
M.	27	2 12	—	—	—	—	0	15	9	2	9	25	7	3	9	41	7	2	6	45	10	8	7	2	10	6
Tu.	28	2 56	0	32	9	2	0	49	9	2	9	56	7	1	10	12	7	0	7	19	10	5	7	36	10	3
W.	29	3 30	1	7	9	1	1	26	9	1	10	29	6	11	10	47	6	9	7	53	10	1	8	9	9	11
T.	30	4 25	1	46	9	0	2	7	8	11	11	6	6	8	11	29	6	6	8	28	9	8	8	49	9	6
F.	31	5 11	2	29	8	10	2	52	8	9	11	55	6	3	—	—	—	—	9	11	9	3	9	37	9	1

Half Mean Spring } 4 ft. 9 in.
Range.

3 ft. 10 in.

5 ft. 7 in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter -	3	4	3	Morning.	1	48	40	9	18	N. 46	17	9	8. 17	25	15	8. 9
Full - - - -	9	10	53	Afternoon.	2	0	42	10	17	33	18	12	36	26	12	31
Last Quarter -	16	5	4	Afternoon.	3	3	N. 24	11	15	5	19	15	18	27	9	20
New - - - -	24	7	18	Afternoon.	4	7	28	12	11	38	20	17	16	28	5	45
					5	11	18	13	7	33	21	18	28	29	1	53
					6	14	38	14	3	9	22	18	51	30	2	N. 9
In Perigee - -	10	2	0	Morning.	7	17	10	15	18	15	23	18	24	31	6	9
In Apogee - -	23	7	0	Afternoon.	8	18	37	16	5	28	24	17	9			

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

JANUARY, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D								
W.	1	8 20 12 2	8 42 11 10	8 36 10 1	8 55 9 11	8 53 11 1	9 11 10 11	6.5																		
Th.	2	9 6 11 7	9 31 11 4	9 17 9 9	9 39 9 7	9 32 10 9	9 55 10 7	7.5																		
F.	3	10 2 11 2	10 34 11 1	10 5 9 5	10 32 9 4	10 25 10 4	10 55 10 3	8																		
S.	4	11 9 11 2	11 44 11 4	11 6 9 4	11 41 9 5	11 27 10 2	11 59 10 1	9.5																		
S.	5	— —	0 19 11 6	— —	0 16 9 6	— —	0 30 10 3	10.5																		
M.	6	0 53 11 10	1 24 12 3	0 53 9 9	1 29 10 0	1 4 10 5	1 38 10 8	11.5																		
Tu.	7	1 52 12 9	2 19 13 3	2 3 10 3	2 34 10 7	2 12 11 0	2 46 11 5	12.5																		
W.	8	2 46 13 9	3 13 14 2	3 4 10 11	3 32 11 4	3 19 11 9	3 50 12 1	13.5																		
Th.	9	3 39 14 8	4 6 15 1	4 0 11 8	4 28 12 0	4 21 12 5	4 51 12 8	14.5																		
F.	10	4 32 15 6	4 57 15 9	4 55 12 3	5 22 12 5	5 18 12 10	5 44 13 0	15.5																		
S.	11	5 22 15 11	5 46 16 0	5 48 12 6	6 13 12 6	6 9 13 2	6 33 13 3	16.5																		
S.	12	6 11 15 10	6 36 15 7	6 37 12 6	7 2 12 4	6 58 13 2	7 22 13 1	17.5																		
M.	13	7 1 15 4	7 26 15 0	7 26 12 2	7 50 11 11	7 46 13 0	8 10 12 9	18.5																		
Tu.	14	7 51 14 6	8 16 14 1	8 13 11 7	8 35 11 3	8 33 12 6	8 54 12 3	19.5																		
W.	15	8 40 13 5	9 5 12 10	8 56 10 11	9 17 10 7	9 13 11 11	9 32 11 7	20.5																		
Th.	16	9 30 12 3	9 55 11 10	9 39 10 2	10 1 9 11	9 53 11 3	10 18 10 10	21.5																		
F.	17	10 26 11 5	11 1 11 2	10 27 9 7	11 0 9 4	10 49 10 5	11 21 10 2	22.5																		
S.	18	11 38 11 0	— —	11 35 9 2	— —	11 53 9 11	— —	23.5																		
S.	19	0 13 10 11	0 47 10 11	0 10 9 1	0 46 9 1	0 25 9 10	0 58 9 10	24.5																		
M.	20	1 20 11 1	1 52 11 4	1 22 9 2	1 59 9 4	1 32 9 11	2 7 10 1	25.5																		
Tu.	21	2 19 11 7	2 43 11 11	2 32 9 6	2 59 9 9	2 42 10 3	3 12 10 6	26.5																		
W.	22	3 7 12 2	3 29 12 5	3 25 9 11	3 48 10 2	3 40 10 8	4 6 10 11	27.5																		
Th.	23	3 48 12 8	4 7 12 11	4 9 10 4	4 30 10 6	4 28 11 1	4 50 11 3	28.5																		
F.	24	4 25 13 3	4 43 13 6	4 49 10 9	5 7 10 11	5 11 11 5	5 30 11 6	29.5																		
S.	25	4 59 13 8	5 16 13 11	5 25 11 0	5 43 11 2	5 47 11 8	6 2 11 9	30.7																		
S.	26	5 33 14 0	5 49 14 1	6 0 11 2	6 16 11 3	6 20 11 10	6 36 11 11	31.7																		
M.	27	6 6 14 1	6 23 14 0	6 32 11 3	6 49 11 3	6 53 12 0	7 10 12 0	32.7																		
Tu.	28	6 39 13 11	6 56 13 10	7 5 11 2	7 21 11 1	7 26 12 0	7 43 12 0	33.7																		
W.	29	7 14 13 8	7 32 13 5	7 38 11 0	7 56 10 11	8 0 11 11	8 16 11 10	34.7																		
Th.	30	7 52 13 3	8 13 12 11	8 14 10 9	8 32 10 7	8 33 11 8	8 50 11 6	35.7																		
F.	31	8 34 12 7	8 57 12 2	8 50 10 4	9 10 10 1	9 7 11 4	9 26 11 2	36.7																		
Half Mean Spring Range.		7ft. 5in.								5ft 10in.								6ft. 2in.								

Half Mean Spring } 7ft. 5in.
Range.

5ft 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	37		9	7	12		17	10	12		25	12	29	
2	4	5		10	7	36		18	10	32		26	12	43	
3	4	33		11	8	0		19	10	51		27	12	56	
4	5	0		12	8	24		20	11	9		28	13	8	
5	5	28		13	8	47		21	11	27		29	13	19	
6	5	54		14	9	9		22	11	44		30	13	29	
7	6	21		15	9	31		23	12	0		31	13	39	
8	6	46		16	9	52		24	12	15					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

FEBRUARY 1868.

WEEK DAY.			MONTH DAY.			MOON'S TRANSIT.			BREST.								DEVONPORT.								PORTSMOUTH.											
									MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
									Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.					
									H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.				
S.	1	6 20	8 21	15	2	8 46	14	9	10 1	13	1	10 25	12	9	3 57	11	2	4 19	10	11																
S.	2	6 51	9 15	14	6	9 51	14	4	10 52	12	8	11 22	12	7	4 43	10	9	5 11	10	6																
M.	3	7 46	10 29	14	4	11 10	14	6	11 59	12	6	—	—	—	5 44	10	4	6 20	10	4																
Tu.	4	8 45	11 52	14	9	—	—	—	0 38	12	8	1 20	12	10	6 59	10	4	7 40	10	7																
W.	5	9 46	0 33	15	4	1 8	16	0	2 1	13	3	2 41	13	5	8 21	10	11	8 59	11	4																
Th.	6	10 48	1 42	16	10	2 11	17	9	3 17	14	2	3 51	14	4	9 34	11	9	10 5	12	2																
F.	7	11 49	2 39	18	8	3 3	19	5	4 22	15	2	4 52	15	2	10 34	12	7	10 59	12	10																
S.	8	morn.	3 28	20	1	3 53	20	6	5 20	16	0	5 47	15	9	11 24	13	1	11 49	13	4																
S.	9	0 48	4 17	20	10	4 40	20	11	6 13	16	6	6 38	16	1	—	—	—	0 13	13	6																
M.	10	1 44	5 3	20	11	5 25	20	9	7 2	16	9	7 23	16	1	0 38	13	7	1 2	13	6																
Tu.	11	2 38	5 46	20	5	6 7	20	0	7 44	16	6	8 6	15	9	1 25	13	5	1 47	13	4																
W.	12	3 29	6 28	19	6	6 47	18	10	8 28	15	11	8 48	15	2	2 8	13	2	2 29	12	11																
Th.	13	4 18	7 9	18	1	7 31	17	3	9 5	15	1	9 22	14	4	2 50	12	7	3 10	12	3																
F.	14	5 7	7 53	16	4	8 16	15	6	9 41	14	1	10 0	13	10	3 31	11	11	3 52	11	6																
S.	15	5 55	8 40	14	7	9 7	13	11	10 21	13	0	10 46	12	7	4 14	11	1	4 37	10	8																
S.	16	6 42	9 38	13	5	10 13	13	1	11 12	12	2	11 41	12	0	5 3	10	3	5 32	9	11																
M.	17	7 30	10 56	12	11	11 37	13	0	—	—	—	0 15	11	9	6 6	9	8	6 45	9	7																
Tu.	18	8 18	—	—	—	0 18	13	2	0 53	11	11	1 32	11	9	7 25	9	7	8 5	9	9																
W.	19	9 5	0 56	13	6	1 29	14	0	2 11	12	4	2 47	12	3	8 45	10	0	9 20	10	4																
Th.	20	9 52	1 54	14	7	2 16	15	3	3 19	13	0	3 48	12	10	9 46	10	7	10 10	10	11																
F.	21	10 39	2 37	15	10	2 55	16	5	4 14	13	9	4 37	13	6	10 32	11	2	10 51	11	5																
S.	22	11 25	3 13	17	0	3 30	17	6	4 59	14	4	5 19	14	0	11 9	11	8	11 26	11	10																
S.	23	0 10	3 47	17	11	4 3	18	3	5 38	14	10	5 56	14	5	11 43	12	0	11 59	12	3																
M.	24	0 54	4 20	18	6	4 36	18	8	6 14	15	2	6 31	14	8	—	—	—	0 16	12	4																
Tu.	25	1 39	4 52	18	10	5 7	18	11	6 48	15	4	7 4	14	10	0 33	12	5	0 50	12	6																
W.	26	2 23	5 23	18	11	5 39	18	9	7 19	15	3	7 34	14	9	1 7	12	6	1 23	12	6																
Th.	27	3 9	5 54	18	7	6 11	18	5	7 50	15	0	8 7	14	7	1 40	12	6	1 57	12	5																
F.	28	3 57	6 29	18	1	6 48	17	8	8 24	14	7	8 41	14	2	2 12	12	4	2 30	12	2																
S.	29	4 47	7 7	17	2	7 29	16	7	8 58	14	1	9 16	13	9	2 49	12	0	3 8	11	10																
Half Mean Spring Range.									9ft. 6in.									7ft. 9in.									6ft. 4in.									
Phases of the Moon.									Moon's Declination at Noon.																											
									D. H. M.				M.D.				°				M.D.				°				M.D.				°			
First Quarter									1 6 16 Afternoon.				1				9N. 58				9				9N. 33				17				18 S. 9			
Full									8 9 35 Morning.				2				13 23				10				5 10				18				18 46			
Last Quarter									15 9 17 Morning.				3				16 10				11				0 36				19				18 33			
New									23 2 20 Afternoon.				4				18 3				12				3S. 51				20				17 31			
													5				18 48				13				7 57				21				15 44			
													6				18 16				14				11 32				22				13 16			
In Perigee									7 3 0 Afternoon.				7				16 25				15				14 29				23				10 12			
In Apogee									20 3 0 Morning.				8				13 25				16				16 43				24				6 41			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m

FEBRUARY, 1868:

WEEK DAY.		MONTH DAY.		DOVER.				SHEERNESS.				LONDON.				C'S AGE AT NOON.											
				MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.													
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		D.							
				H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.								
S.	1	3	38	16	24	4	0	16	0	5	6	14	4	5	29	14	0	6	36	17	6	7	0	17	3	1	D
S.	2	4	23	15	7	4	49	15	3	5	54	13	10	6	20	13	7	7	24	16	11	7	50	16	8	8	8.7
M.	3	5	19	15	0	5	51	14	11	6	53	13	5	7	31	13	4	8	20	16	6	8	58	16	4	9	9.7
Tu.	4	6	27	14	11	7	6	15	3	8	11	13	5	8	51	13	7	9	37	16	3	10	16	16	3	10	10.7
W.	5	7	47	15	10	8	24	16	5	9	31	13	11	10	10	14	3	10	57	16	6	11	38	16	9	11	11.7
Th.	6	8	57	17	1	9	28	17	9	10	44	14	8	11	16	15	2	—	—	—	—	0	14	17	2	12	12.7
F.	7	9	58	18	4	10	25	18	11	11	44	15	7	—	—	—	—	0	46	17	8	1	14	18	2	13	13.7
S.	8	10	52	19	5	11	19	19	10	0	11	16	0	0	36	16	4	1	40	18	9	2	7	19	2	14	14.7
S.	9	11	46	20	1	—	—	—	—	1	1	16	9	1	26	17	0	2	32	19	7	2	56	20	0	15	15.7
M.	10	0	12	20	2	0	36	20	3	1	50	17	2	2	13	17	2	3	19	20	3	3	41	20	4	16	16.7
Tu.	11	1	0	20	1	1	24	19	11	2	34	17	1	2	55	17	0	4	4	20	4	4	26	20	3	17	17.7
W.	12	1	47	19	7	2	9	19	3	3	16	16	10	3	37	16	7	4	47	20	1	5	9	19	10	18	18.7
Th.	13	2	31	18	9	2	52	18	2	3	58	16	3	4	19	15	10	5	29	19	6	5	49	19	1	19	19.7
F.	14	3	12	17	6	3	33	16	11	4	40	15	5	5	1	14	11	6	11	18	8	6	31	18	2	20	20.7
S.	15	3	55	16	2	4	18	15	6	5	23	14	5	5	48	14	0	6	53	17	8	7	17	17	1	21	21.7
S.	16	4	43	14	10	5	8	14	4	6	15	13	6	6	45	13	1	7	41	16	7	8	11	16	2	22	22.7
M.	17	5	38	13	11	6	14	13	8	7	18	12	10	7	55	12	8	8	45	15	9	9	23	15	6	23	23.7
Tu.	18	6	52	13	9	7	35	14	0	8	37	12	8	9	17	12	10	10	2	15	4	10	43	15	4	24	24.7
W.	19	8	11	14	4	8	45	14	9	9	55	13	0	10	33	13	3	11	23	15	5	12	0	15	7	25	25.7
Th.	20	9	10	15	3	9	33	15	9	11	4	13	7	11	28	13	10	—	—	—	—	0	33	15	11	26	26.7
F.	21	9	55	16	1	10	15	16	6	11	50	14	2	—	—	—	—	0	57	16	3	1	18	16	7	27	27.7
S.	22	10	35	16	11	10	54	17	4	0	10	14	6	0	28	14	9	1	39	17	0	2	0	17	4	28	28.7
S.	23	11	12	17	8	11	31	17	11	0	46	15	0	1	3	15	3	2	18	17	8	2	34	18	0	29	29.7
M.	24	11	49	18	2	—	—	—	—	1	20	15	6	1	36	15	8	2	51	18	4	3	7	18	7	30	30.7
Tu.	25	0	6	18	4	0	23	18	6	1	52	15	10	2	8	15	11	3	23	18	9	3	38	18	11	31	31.7
W.	26	0	41	18	7	0	59	18	7	2	23	15	11	2	39	16	0	3	54	19	0	4	8	19	1	32	32.7
Th.	27	1	18	18	6	1	35	18	5	2	54	15	11	3	10	15	11	4	24	19	1	4	40	19	1	33	33.7
F.	28	1	52	18	4	2	11	18	1	3	25	15	9	3	41	15	7	4	55	18	11	5	13	18	10	34	34.7
S.	29	2	30	17	10	2	50	17	5	3	59	15	5	4	18	15	2	5	31	18	8	5	50	18	4	35	35.7
Half Mean Spring Range.				9ft. 4in.				8ft. 0in.				9ft. 7in.															

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	48		9	14	27		17	14	16		25	13	22	
2	13	56		10	14	28		18	14	12		26	13	12	
3	14	3		11	14	29		19	14	7		27	13	2	
4	14	9		12	14	29		20	14	1		28	12	51	
5	14	14		13	14	28		21	13	54		29	12	40	
6	14	19		14	14	26		22	13	47					
7	14	22		15	14	24		23	13	39					
8	14	25		16	14	20		24	13	31					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

FEBRUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H. M. F. I.				H. M. F. I.				H. M. F. I.				H. M. F. I.				H. M. F. I.			H. M. F. I.				
S.	1	6 20	4 22 10 4				4 43 10 3				11 6 17 11				11 34 17 6				8 1 12 2				8 26 11 10			
S.	2	6 51	5 7 10 1				5 32 10 0				—				0 4 17 3				8 52 11 8				9 24 11 6			
M.	3	7 46	6 1 9 11				6 37 9 11				0 38 16 11				1 13 16 9				10 1 11 4				10 39 11 4			
Tu.	4	8 45	7 18 9 11				7 59 10 0				1 48 16 10				2 24 17 0				11 17 11 5				11 54 11 8			
W.	5	9 46	8 39 10 3				9 17 10 6				3 1 17 5				3 38 18 1				—				0 29 12 1			
Th.	6	10 48	9 51 10 9				10 25 11 1				4 13 18 9				4 45 19 6				1 3 12 7				1 35 13 2			
F.	7	11 49	10 55 11 4				11 23 11 8				5 13 20 2				5 40 20 9				2 6 13 7				2 35 14 1			
S.	8	morn.	11 49 11 11				—				6 5 21 3				6 31 21 9				3 0 14 6				3 25 14 10			
S.	9	0 48	0 14 12 1				0 39 12 2				6 57 22 1				7 21 22 5				3 49 15 3				4 12 15 6			
M.	10	1 44	1 3 12 3				1 26 12 3				7 45 22 6				8 8 22 6				4 35 15 7				4 57 15 7			
Tu.	11	2 38	1 49 12 2				2 11 12 1				8 29 22 5				8 51 22 1				5 19 15 5				5 41 15 2			
W.	12	3 29	2 33 11 11				2 55 11 9				9 12 21 8				9 34 21 1				6 3 14 9				6 25 14 3			
Th.	13	4 18	3 16 11 6				3 37 11 3				9 55 20 6				10 15 19 10				6 48 13 11				7 10 13 6			
F.	14	5 7	3 57 11 0				4 17 10 9				10 37 19 2				11 0 18 6				7 33 13 0				7 56 12 6			
S.	15	5 55	4 39 10 6				5 2 10 2				11 28 17 9				11 57 17 1				8 21 12 0				8 47 11 6			
S.	16	6 42	5 26 9 11				5 53 9 8				—				0 29 16 6				9 16 11 2				9 49 10 10			
M.	17	7 30	6 24 9 6				7 2 9 5				1 2 16 0				1 36 15 8				10 25 10 7				11 4 10 6			
Tu.	18	8 18	7 45 9 5				8 25 9 6				2 12 15 7				2 49 15 9				11 42 10 7				—			
W.	19	9 5	9 3 9 8				9 40 9 10				3 25 16 1				4 1 16 7				0 17 10 9				0 51 11 0			
Th.	20	9 52	10 13 10 0				10 38 10 2				4 33 17 0				4 57 17 6				1 23 11 4				1 48 11 8			
F.	21	10 39	11 1 10 5				11 21 10 7				5 19 18 0				5 38 18 5				2 11 12 1				2 32 12 3			
S.	22	11 25	11 40 10 10				11 58 11 0				5 56 18 10				6 15 19 2				2 52 12 8				3 11 13 0			
S.	23	0 10	—				0 16 11 2				6 33 19 6				6 50 19 10				3 28 13 3				3 43 13 6			
M.	24	0 54	0 33 11 3				0 49 11 4				7 7 20 2				7 24 20 5				3 59 13 10				4 15 14 1			
Tu.	25	1 39	1 5 11 5				1 21 11 5				7 40 20 6				7 56 20 8				4 30 14 2				4 46 14 3			
W.	26	2 23	1 37 11 5				1 53 11 5				8 12 20 9				8 28 20 9				5 2 14 3				5 18 14 3			
Th.	27	3 9	2 10 11 4				2 27 11 4				8 45 20 8				9 1 20 5				5 35 14 1				5 51 13 11			
F.	28	3 57	2 42 11 3				2 59 11 1				9 17 20 2				9 35 19 10				6 8 13 9				6 27 13 6			
S.	29	4 47	3 17 11 0				3 36 10 10				9 54 19 6				10 13 19 1				6 47 13 3				7 8 12 11			
Half Mean Spring Range.			5 ft. 9 in.								10 ft. 5 in.								7 ft. 2 in.							

Phases of the Moon.					Moon's Declination at Noon.											
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter	1	6	16	Afternoon.	1	9	N. 58	9	9	N. 33	17	18	S. 9	25	28	S. 51
Full - - -	8	9	35	Morning.	2	13	23	10	5	10	18	18	46	26	1	N. 13
Last Quarter	15	9	17	Morning.	3	16	10	11	0	36	19	18	33	27	5	12
New - - -	23	2	20	Afternoon.	4	18	3	12	3	S. 51	20	17	31	28	9	3
					5	18	48	13	7	57	21	15	44	29	12	32
In Perigee -	7	3	0	Afternoon.	6	18	16	14	11	32	22	13	16			
In Apogee -	20	3	0	Morning.	7	16	25	15	14	29	23	10	12			
					8	13	25	16	16	43	24	6	41			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — for HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

FEBRUARY, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D.
S.	1	8 5 11 0		8 32 10 8		7 0 13 10		7 26 13 6		0 52 10 8		1 18 10 5		☾
M.	2	9 0 10 5		9 34 10 3		7 55 13 3		8 28 13 0		1 45 10 2		2 19 10 0		8.7
Tu.	3	10 14 10 3		10 52 10 4		9 7 12 11		9 46 13 0		2 59 9 10		3 41 9 10		9.7
W.	4	11 29 10 6		— — — —		10 24 13 1		11 1 13 4		4 22 9 11		5 2 10 1		10.7
Th.	5	0 7 10 9		0 43 11 1		11 36 13 9		— — — —		5 38 10 4		6 11 10 11		11.7
F.	6	1 15 11 6		1 45 11 11		0 10 14 2		0 39 14 9		6 40 11 6		7 5 12 2		12.7
S.	7	2 12 12 5		2 38 12 11		1 7 15 4		1 34 16 0		7 28 12 11		7 49 13 6		13.7
M.	8	3 2 13 5		3 25 13 10		1 58 16 6		2 23 17 0		8 12 14 0		8 35 14 4		☉
Tu.	9	3 49 14 1		4 13 14 4		2 47 17 4		3 10 17 6		8 58 14 6		9 21 14 6		15.7
W.	10	4 36 14 5		4 59 14 4		3 32 17 7		3 54 17 6		9 44 14 5		10 6 14 3		16.7
Th.	11	5 22 14 1		5 44 13 10		4 16 17 3		4 39 17 0		10 29 14 0		10 52 13 7		17.7
F.	12	6 7 13 7		6 29 13 3		5 2 16 8		5 24 16 4		11 14 13 2		11 37 12 8		18.7
S.	13	6 51 12 10		7 12 12 5		5 46 15 11		6 8 15 5		12 0 12 3		— — — —		19.7
M.	14	7 34 12 0		7 58 11 5		6 31 14 10		6 54 14 3		0 22 11 8		0 46 11 1		20.7
Tu.	15	8 26 10 10		8 55 10 4		7 20 13 8		7 49 13 2		1 12 10 7		1 39 10 1		☾
W.	16	9 26 9 11		10 2 9 8		8 20 12 8		8 54 12 4		2 11 9 7		2 46 9 3		22.7
Th.	17	10 38 9 6		11 16 9 6		9 30 12 1		10 11 12 0		3 24 9 0		4 9 8 10		23.7
F.	18	11 55 9 7		— — — —		10 48 12 1		11 24 12 3		4 48 8 10		5 25 8 11		24.7
S.	19	0 31 9 9		1 6 9 11		11 59 12 6		— — — —		6 1 9 2		6 31 9 6		25.7
M.	20	1 36 10 3		1 58 10 6		0 30 12 9		0 52 13 2		6 53 9 11		7 12 10 5		26.7
Tu.	21	2 18 10 10		2 37 11 2		1 12 13 8		1 32 14 1		7 29 10 11		7 45 11 4		27.7
W.	22	2 55 11 7		3 12 11 11		1 51 14 6		2 9 14 10		8 0 11 10		8 15 12 2		28.7
Th.	23	3 28 12 2		3 44 12 5		2 26 15 3		2 42 15 6		8 30 12 6		8 46 12 9		☉
F.	24	4 0 12 8		4 16 12 10		2 58 15 9		3 13 16 0		9 1 12 11		9 16 13 0		0.9
S.	25	4 31 13 0		4 47 13 0		3 27 16 0		3 42 16 1		9 31 13 0		9 48 13 0		1.9
M.	26	5 4 13 0		5 21 12 11		3 58 16 0		4 15 16 0		10 5 13 0		10 22 12 10		2.9
Tu.	27	5 38 12 10		5 54 12 8		4 32 15 10		4 49 15 9		10 39 12 8		10 57 12 6		3.9
W.	28	6 12 12 7		6 31 12 5		5 6 15 7		5 25 15 4		11 16 12 3		11 37 11 11		4.9
Th.	29	6 50 12 2		7 10 11 11		5 45 15 1		6 6 14 9		11 58 11 7		— — — —		5.9
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	48		9	14	27		17	14	16		25	13	22	
2	13	56		10	14	28		18	14	12		26	13	12	
3	14	3		11	14	29		19	14	7		27	13	2	
4	14	9		12	14	29		20	14	1		28	12	51	
5	14	14		13	14	28		21	13	54		29	12	40	
6	14	19		14	14	26		22	13	47					
7	14	22		15	14	24		23	13	39					
8	14	25		16	14	20		24	13	31					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

FEBRUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.						LIVERPOOL.						PEMBROKE.								
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.					
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.				
S.	1	6a 0	4 21	9 0		4 43	8 10		3 32	22 3		3 54	21 9		10 40	17 4		11 11	16 11				
S.	2	6 51	5 7	8 9		5 36	8 7		4 20	21 4		4 52	20 10		11 25	16 5		11 56	16 8				
M.	3	7 46	6 10	8 6		6 46	8 5		5 31	20 8		6 11	20 9		—	—		0 29	16 1				
Tu.	4	8 45	7 25	8 5		8 5	8 6		6 54	21 0		7 35	21 5		1 7	16 2		1 52	16 6				
W.	5	9 46	8 45	8 8		9 21	8 11		8 13	22 2		8 47	22 11		2 36	17 1		3 15	17 10				
Th.	6	10 48	9 55	9 2		10 26	9 4		9 18	23 10		9 46	24 9		3 51	18 9		4 45	19 7				
F.	7	11 49	10 55	9 7		11 22	9 9		10 12	25 8		10 37	26 4		4 57	20 6		5 26	21 2				
S.	8	morn.	11 49	9 11		—	—		11 3	26 11		11 28	27 6		5 54	21 10		6 20	22 4				
S.	9	0 48	0 16	10 1		0 41	10 3		11 52	27 11		—	—		6 44	22 8		7 8	23 10				
M.	10	1 44	1 5	10 4		1 29	10 4		0 16	28 1		0 39	28 1		7 30	22 11		7 51	23 8				
Tu.	11	2 38	1 51	10 3		2 12	10 3		1 1	27 11		1 23	27 7		8 13	22 4		8 35	23 11				
W.	12	3 29	2 33	10 2		2 55	10 0		1 44	27 0		2 5	26 4		8 56	21 5		9 18	20 9				
Th.	13	4 18	3 16	9 9		3 35	9 7		2 25	25 6		2 45	24 9		9 36	20 0		9 55	19 3				
F.	14	5 7	3 54	9 5		4 14	9 2		3 4	23 11		3 25	23 0		10 15	18 6		10 35	17 8				
S.	15	5 55	4 37	8 11		5 1	8 8		3 49	22 0		4 15	21 1		10 56	16 9		11 19	15 12				
S.	16	6 42	5 28	8 5		5 58	8 3		4 44	20 3		5 18	19 8		11 44	15 4		—	—				
M.	17	7 30	6 32	8 1		7 11	7 11		5 55	19 4		6 39	19 3		0 15	14 11		0 52	14 8				
Tu.	18	8 18	7 51	7 11		8 30	8 0		7 21	19 4		7 59	19 8		1 35	14 8		2 19	14 11				
W.	19	9 5	9 8	8 2		9 42	8 4		8 36	20 1		9 8	20 8		3 0	15 3		3 36	15 10				
Th.	20	9 52	10 8	8 5		10 31	8 7		9 31	21 4		9 52	22 0		4 3	16 6		4 29	17 0				
F.	21	10 39	10 52	8 9		11 12	8 11		10 12	22 7		10 30	23 1		4 53	17 8		5 15	18 3				
S.	22	11 25	11 32	9 0		11 51	9 1		10 47	23 7		11 4	24 1		5 36	18 9		5 56	19 4				
S.	23	0a 10	—	—		0 9	9 3		11 21	24 6		11 38	25 0		6 14	19 8		6 31	20 1				
M.	24	0 54	0 27	9 5		0 44	9 6		11 55	25 4		—	—		6 47	20 5		7 3	20 7				
Tu.	25	1 39	1 0	9 7		1 17	9 8		0 12	25 6		0 28	25 9		7 18	20 9		7 34	20 10				
W.	26	2 23	1 34	9 8		1 50	9 9		0 44	25 10		1 0	25 10		7 50	20 9		8 6	20 8				
Th.	27	3 9	2 6	9 9		2 22	9 8		1 16	25 8		1 32	25 5		8 22	20 6		8 39	20 4				
F.	28	3 57	2 38	9 7		2 55	9 6		1 48	25 2		2 6	24 9		8 57	20 0		9 16	19 7				
S.	29	4 47	3 13	9 5		3 32	9 4		2 25	24 3		2 43	23 9		9 34	19 1		9 53	18 8				
Half Mean Spring Range.			4ft. 10in.						13ft. 0in.						10ft. 6in.								
Phases of the Moon.												Moon's Declination at Noon.											
D. H. M.												M.D. ° '											
First Quarter 1 6 16 Afternoon.												1 9 N. 58 9 9 N. 33 17 18 S. 9 25 25 51											
Full - - - - 8 9 35 Morning.												2 13 23 10 5 10 18 18 46 26 18 10											
Last Quarter - 15 9 17 Morning.												3 16 10 11 0 36 19 18 33 27 5 12											
New - - - - 23 2 20 Afternoon.												4 18 3 12 3 S. 51 20 17 31 28 9 3											
												5 18 48 13 7 57 21 15 44 29 12 52											
												6 18 16 14 11 32 22 13 16											
In Perigee - - 7 3 0 Afternoon.												7 16 25 15 14 29 23 10 12											
In Apogee - - 20 3 0 Morning.												8 13 25 16 16 43 24 6 41											

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

FEBRUARY, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
S.	1	11 7 31	7	11 28 30	10	2 33 13	9	2 59 13	6	3 32 9	7	3 57 9	5	D.
S.	2	11 56 30	2	—	—	3 26 13	3	4 0 13	1	4 25 9	3	4 58 9	1	8.7
M.	3	0 30 29	9	1 5 29	7	4 40 12	11	5 19 13	0	5 34 9	0	6 9 9	1	9.7
Tu.	4	1 45 29	9	2 26 30	3	5 57 13	2	6 35 13	5	6 45 9	2	7 22 9	4	10.7
W.	5	3 8 31	1	3 49 32	2	7 10 13	9	7 43 14	3	7 58 9	7	8 33 9	10	11.7
Th.	6	4 29 33	6	5 5 34	11	8 14 14	9	8 42 15	3	9 7 10	2	9 39 10	5	12.7
F.	7	5 38 36	4	6 8 37	5	9 8 15	10	9 32 16	3	10 8 10	9	10 31 11	0	13.7
S.	8	6 36 38	6	7 2 39	3	9 56 16	8	10 21 17	0	10 54 11	3	11 18 11	6	○
S.	9	7 27 39	11	7 51 40	4	10 43 17	2	11 4 17	3	11 41 11	8	—	—	15.7
M.	10	8 13 40	4	8 34 40	1	11 25 17	3	11 47 17	1	0 4 11	8	0 27 11	7	16.7
Tu.	11	8 55 39	9	9 15 39	1	—	—	0 10 16	11	0 50 11	6	1 13 11	4	17.7
W.	12	9 35 38	4	9 54 37	3	0 33 16	7	0 57 16	2	1 36 11	2	1 58 10	11	18.7
Th.	13	10 11 36	1	10 27 34	10	1 20 15	8	1 42 15	3	2 20 10	7	2 42 10	4	19.7
F.	14	10 44 33	6	11 2 32	0	2 4 14	8	2 27 14	2	3 4 10	1	3 26 9	10	20.7
S.	15	11 23 30	7	11 48 29	4	2 53 13	8	3 20 13	1	3 51 9	6	4 19 9	2	○
S.	16	—	—	0 17 28	4	3 52 12	8	4 27 12	4	4 50 8	11	5 22 8	8	22.7
M.	17	0 51 27	7	1 31 27	3	5 3 12	2	5 44 12	1	5 56 8	7	6 32 8	7	23.7
Tu.	18	2 12 27	3	2 53 27	7	6 22 12	2	6 58 12	4	7 9 8	8	7 45 8	9	24.7
W.	19	3 33 28	1	4 11 28	11	7 33 12	6	8 3 12	10	8 21 8	11	8 54 9	1	25.7
Th.	20	4 41 29	9	5 8 30	10	8 26 13	2	8 48 13	7	9 20 9	4	9 44 9	6	26.7
F.	21	5 33 31	10	5 56 32	8	9 7 13	11	9 24 14	3	10 6 9	9	10 24 9	11	27.7
S.	22	6 17 33	6	6 37 34	4	9 42 14	7	9 59 14	11	10 41 10	1	10 56 10	4	28.7
S.	23	6 55 35	0	7 13 35	7	10 15 15	2	10 31 15	5	11 12 10	6	11 28 10	8	●
M.	24	7 30 36	2	7 46 36	7	10 46 15	7	10 59 15	9	11 44 10	9	11 59 10	10	0.9
Tu.	25	8 2 36	10	8 18 37	0	11 14 15	9	11 29 15	10	—	—	0 15 10	10	1.9
W.	26	8 33 37	1	8 49 37	0	11 46 15	10	—	—	0 32 10	10	0 49 10	9	2.9
Th.	27	9 4 36	9	9 19 36	6	0 4 15	9	0 21 15	7	1 6 10	9	1 23 10	8	3.9
F.	28	9 35 36	1	9 52 35	5	0 38 15	5	0 58 15	3	1 40 10	6	1 59 10	4	4.9
S.	29	10 8 34	8	10 25 33	10	1 19 14	11	1 40 14	7	2 19 10	2	2 40 10	0	5.9
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	48	Sub.	9	14	27	Sub.	17	14	16	Sub.	25	13	22	Sub.
2	13	56		10	14	28		18	14	12		26	13	12	
3	14	3		11	14	29		19	14	7		27	13	2	
4	14	9		12	14	29		20	14	1		28	12	51	
5	14	14		13	14	28		21	13	54		29	12	40	
6	14	19		14	14	26		22	13	47					
7	14	22		15	14	24		23	13	39					
8	14	25		16	14	20		24	13	31					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. HOLYHEAD add 18 m. KINGSTOWN subtract 1 m. for Dublin Time.

FEBRUARY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
S.	1	6 20	3 16	8 7	3 41	8 6	0 24	6 1	0 56	5 11	10 5	8 11	10 35	8 9	
S.	2	6 51	4 7	8 5	4 39	8 4	1 29	5 10	2 10	5 9	11 9	8 8	11 47	8 7	
M.	3	7 46	5 14	8 3	5 50	8 3	2 52	5 10	3 28	6 0	—	—	0 24	8 8	
Tu.	4	8 45	6 27	8 2	7 7	8 3	4 3	6 2	4 36	6 5	1 1	8 9	1 39	8 11	
W.	5	9 46	7 44	8 4	8 18	8 7	5 6	6 8	5 33	6 10	2 17	9 2	2 50	9 7	
Th.	6	10 48	8 48	8 10	9 16	9 1	6 0	7 1	6 26	7 4	3 19	10 0	3 45	10 5	
F.	7	11 49	9 43	9 4	10 8	9 7	6 53	7 8	7 19	7 10	4 10	10 11	4 34	11 3	
S.	8	morn.	10 33	9 9	10 57	9 10	7 46	8 1	8 11	8 3	4 59	11 8	5 25	11 11	
S.	9	0 48	11 20	9 11	11 42	9 11	8 33	8 5	8 54	8 5	5 49	12 1	6 12	12 2	
M.	10	1 44	—	—	0 3	9 11	9 15	8 4	9 35	8 2	6 34	12 1	6 56	11 11	
Tu.	11	2 38	0 26	9 10	0 49	9 9	9 56	8 0	10 16	7 10	7 18	11 8	7 40	11 4	
W.	12	3 29	1 12	9 8	1 35	9 6	10 37	7 7	10 59	7 4	8 1	11 0	8 22	10 7	
Th.	13	4 18	1 59	9 4	2 22	9 2	11 21	7 0	11 47	6 8	8 43	10 2	9 5	9 9	
F.	14	5 7	2 46	9 0	3 10	8 9	—	—	0 15	6 4	9 30	9 5	9 58	9 9	
S.	15	5 55	3 35	8 6	4 2	8 4	0 48	5 11	1 22	5 9	10 28	8 8	11 1	8 4	
S.	16	6 42	4 31	8 2	5 3	8 0	2 0	5 7	2 39	5 5	11 35	8 2	—	—	
M.	17	7 30	5 37	7 11	6 14	7 10	3 15	5 5	3 51	5 6	0 10	8 0	0 48	7 11	
Tu.	18	8 18	6 53	7 10	7 31	7 10	4 26	5 8	4 57	5 10	1 27	8 0	2 4	8 1	
W.	19	9 5	8 7	7 11	8 38	8 1	5 27	5 11	5 54	6 1	2 40	8 3	3 10	8 7	
Th.	20	9 52	9 1	8 3	9 22	8 6	6 10	6 3	6 32	6 5	3 31	8 11	3 52	9 2	
F.	21	10 39	9 42	8 8	10 0	8 10	6 52	6 7	7 11	6 9	4 9	9 6	4 26	9 13	
S.	22	11 25	10 18	9 0	10 35	9 1	7 30	6 11	7 48	7 1	4 44	10 1	5 1	10 4	
S.	23	0 10	10 51	9 2	11 7	9 3	8 5	7 3	8 21	7 5	5 18	10 7	5 36	10 10	
M.	24	0 54	11 23	9 4	11 37	9 4	8 36	7 6	8 50	7 7	5 52	11 0	6 7	11 1	
Tu.	25	1 39	11 52	9 4	—	—	9 4	7 7	9 19	7 7	6 22	11 1	6 37	11 1	
W.	26	2 23	0 7	9 4	0 24	9 4	9 34	7 6	9 50	7 5	6 54	11 0	7 11	10 10	
Th.	27	3 9	0 42	9 4	0 59	9 4	10 5	7 4	10 21	7 2	7 28	10 8	7 44	10 6	
F.	28	3 57	1 17	9 3	1 37	9 2	10 38	7 1	10 58	6 11	8 2	10 3	8 21	10 6	
S.	29	4 47	1 58	9 1	2 21	9 0	11 20	6 8	11 46	6 6	8 41	9 9	9 3	9 6	
Half Mean Spring Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter	1	6	16	Afternoon.			1	9	N. 58	9	9	N. 33	17	18	8. 9
Full - - - - -	8	9	35	Morning.			2	13	23	10	5	10	18	18	46
Last Quarter -	15	9	17	Morning.			3	16	10	11	0	36	19	18	33
New - - - - -	23	2	20	Afternoon.			4	18	3	12	38	51	20	17	31
							5	18	48	13	7	57	21	15	44
In Perigee - -	7	3	0	Afternoon.			6	18	16	14	11	32	22	13	16
In Apogee - -	20	3	0	Morning.			7	16	25	15	14	29	23	10	12
							8	13	25	16	16	43	24	6	41

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, - for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

FEBRUARY, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	D.								
S.	1	9 21 11 10	9 46 11 6	9 31 9 11	9 53 9 8	9 46 10 11	10 10 10 8)																		
M.	2	10 18 11 4	10 56 11 3	10 20 9 6	10 55 9 5	10 41 10 5	11 15 10 3	8.7																		
Tu.	3	11 34 11 3	— —	11 31 9 5	— —	11 50 10 2	— —	9.7																		
W.	4	0 13 11 5	0 52 11 8	0 11 9 5	0 51 9 7	0 26 10 2	1 3 10 4	10.7																		
Th.	5	1 28 12 1	2 1 12 8	1 32 9 11	2 11 10 3	1 41 10 7	2 20 11 0	11.7																		
F.	6	2 31 13 3	3 1 13 9	2 47 10 7	3 19 11 0	2 59 11 5	3 34 11 10	12.7																		
S.	7	3 29 14 4	3 54 14 10	3 49 11 5	4 16 11 10	4 7 12 3	4 37 12 7	13.7																		
M.	8	4 19 15 4	4 44 15 9	4 42 12 2	5 8 12 5	5 5 12 10	5 31 13 0	○																		
Tu.	9	5 8 16 1	5 31 16 3	5 33 12 7	5 58 12 8	5 55 13 3	6 18 13 4	15.7																		
W.	10	5 54 16 3	6 17 16 1	6 21 12 8	6 43 12 7	6 41 13 4	7 4 13 4	16.7																		
Th.	11	6 39 15 10	7 1 15 6	7 5 12 6	7 26 12 3	7 26 13 3	7 47 13 1	17.7																		
F.	12	7 23 15 1	7 45 14 6	7 47 11 11	8 8 11 7	8 8 12 10	8 27 12 6	18.7																		
S.	13	8 7 14 0	8 29 13 5	8 27 11 3	8 45 10 10	8 45 12 3	9 3 11 10	19.7																		
M.	14	8 52 12 8	9 16 12 0	9 5 10 5	9 26 10 0	9 21 11 6	9 41 11 1	20.7																		
Tu.	15	9 41 11 5	10 10 10 11	9 48 9 7	10 13 9 3	10 4 10 7	10 33 10 2	☾																		
W.	16	10 43 10 7	11 18 10 4	10 42 9 0	11 17 8 9	11 4 9 10	11 37 9 7	22.7																		
Th.	17	12 0 10 3	— —	11 57 8 8	— —	— —	0 13 9 5	23.7																		
F.	18	0 39 10 4	1 15 10 6	0 37 8 8	1 17 8 10	0 50 9 5	1 27 9 6	24.7																		
S.	19	1 50 10 9	2 22 11 2	1 57 9 0	2 32 9 2	2 5 9 8	2 42 9 11	25.7																		
M.	20	2 44 11 6	3 6 11 11	2 58 9 6	3 23 9 9	3 10 10 3	3 38 10 7	26.7																		
Tu.	21	3 28 12 4	3 47 12 8	3 46 10 1	4 6 10 4	4 2 10 10	4 25 11 1	27.7																		
W.	22	4 4 13 0	4 21 13 5	4 26 10 7	4 44 10 10	4 46 11 4	5 7 11 7	28.7																		
Th.	23	4 38 13 9	4 54 14 1	5 1 11 1	5 19 11 3	5 25 11 9	5 42 11 11	●																		
F.	24	5 10 14 4	5 26 14 6	5 36 11 6	5 53 11 7	5 57 12 1	6 13 12 3	0.9																		
S.	25	5 42 14 7	5 59 14 8	6 9 11 7	6 25 11 8	6 29 12 3	6 46 12 4	1.9																		
M.	26	6 16 14 8	6 33 14 7	6 42 11 8	6 59 11 8	7 2 12 5	7 19 12 5	2.9																		
Tu.	27	6 49 14 5	7 6 14 3	7 15 11 6	7 31 11 5	7 35 12 4	7 51 12 3	3.9																		
W.	28	7 24 14 0	7 44 13 8	7 48 11 3	8 6 11 0	8 8 12 2	8 26 12 0	4.9																		
Th.	29	8 5 13 4	8 27 12 11	8 24 10 10	8 42 10 7	8 43 11 9	9 1 11 6	5.9																		
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.																

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	48		9	14	27		17	14	16		25	13	22	
2	13	56		10	14	28		18	14	12		26	13	12	
3	14	3		11	14	29		19	14	7		27	13	2	
4	14	9		12	14	29		20	14	1		28	12	51	
5	14	14		13	14	28		21	13	54		29	12	40	
6	14	19		14	14	26		22	13	47					
7	14	22		15	14	24		23	13	39					
8	14	25		16	14	20		24	13	31					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

B

MARCH, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	5 39	7 53	16 0	8 19	15 4	9 38	13 6	10 1	13 3	3 29	11 7	3 52	11 4
M.	2	6 34	8 48	14 8	9 20	14 3	10 26	13 0	10 57	12 10	4 17	11 0	4 45	10 8
Tu.	3	7 32	9 58	14 1	10 43	14 2	11 30	12 6	—	—	5 15	10 5	5 51	10 3
W.	4	8 31	11 32	14 5	—	—	0 10	12 9	0 52	12 6	6 34	10 2	7 20	10 4
Th.	5	9 31	0 16	14 10	0 53	15 6	1 35	13 2	2 19	13 1	8 3	10 8	8 43	11 0
F.	6	10 30	1 29	16 5	1 57	17 5	2 59	14 1	3 37	14 1	9 20	11 6	9 51	12 0
S.	7	11 26	2 24	18 5	2 48	19 3	4 8	15 1	4 37	14 11	10 19	12 5	10 44	12 10
S.	8	morn.	3 12	20 0	3 35	20 5	5 5	16 0	5 31	15 7	11 8	13 1	11 32	13 4
M.	9	0 21	3 57	20 9	4 20	20 11	5 55	16 5	6 19	16 1	11 54	13 6	—	—
Tu.	10	1 14	4 42	20 11	5 2	20 10	6 42	16 8	7 4	16 1	0 16	13 7	0 39	13 7
W.	11	2 6	5 22	20 6	5 42	20 1	7 22	16 5	7 41	15 11	1 2	13 6	1 23	13 4
Th.	12	2 56	6 1	19 7	6 20	19 1	7 59	15 11	8 18	15 3	1 43	13 2	2 2	12 11
F.	13	3 45	6 39	18 4	6 58	17 6	8 36	15 0	8 52	14 6	2 21	12 8	2 40	12 3
S.	14	4 34	7 18	16 8	7 40	15 9	9 8	14 0	9 25	13 7	2 59	12 0	3 19	11 7
S.	15	5 23	8 2	14 10	8 26	14 0	9 45	13 0	10 6	12 8	3 39	11 2	4 0	10 0
M.	16	6 12	8 53	13 4	9 27	12 10	10 29	12 1	10 56	12 0	4 23	10 4	4 49	10 0
Tu.	17	7 0	10 5	12 7	10 49	12 6	11 26	11 5	—	—	5 21	9 8	5 57	9 9
W.	18	7 47	11 33	12 7	—	—	0 4	11 8	0 43	11 3	6 38	9 4	7 21	9 9
Th.	19	8 34	0 15	12 11	0 50	13 5	1 23	11 11	2 3	11 9	8 2	9 8	8 39	10 0
F.	20	9 20	1 22	14 0	1 48	14 8	2 40	12 8	3 12	12 6	9 13	10 4	9 39	10 0
S.	21	10 5	2 8	15 5	2 27	16 2	3 42	13 6	4 6	13 3	10 1	11 0	10 22	11 4
S.	22	10 50	2 44	16 10	3 1	17 6	4 29	14 2	4 50	13 11	10 40	11 8	10 57	11 12
M.	23	11 35	3 18	18 1	3 35	18 6	5 9	14 10	5 28	14 7	11 14	12 2	11 31	12 4
Tu.	24	0 20	3 51	18 10	4 7	19 1	5 46	15 4	6 4	15 1	11 47	12 6	—	—
W.	25	1 6	4 24	19 3	4 41	19 5	6 22	15 7	6 39	15 4	0 3	12 8	0 20	12 0
Th.	26	1 54	4 58	19 6	5 15	19 5	6 56	15 8	7 11	15 4	0 38	12 10	0 57	12 0
F.	27	2 44	5 32	19 3	5 49	19 0	7 27	15 4	7 44	15 0	1 15	12 9	1 33	12 0
S.	28	3 36	6 7	18 8	6 27	18 3	8 3	15 0	8 22	14 9	1 51	12 7	2 9	12 0
S.	29	4 30	6 48	17 8	7 10	16 0	8 41	14 6	9 0	14 3	2 28	12 3	2 49	12 0
M.	30	5 26	7 35	16 3	8 2	15 7	9 22	13 10	9 46	13 9	3 10	11 9	3 34	11 3
Tu.	31	6 24	8 31	14 11	9 4	14 6	10 13	13 1	10 43	13 2	4 0	11 2	4 28	10 10

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
First Quarter-	2	4	49	Morning.
Full - - - -	8	8	22	Afternoon.
Last Quarter -	16	3	28	Morning.
New- - - - -	24	6	59	Morning.
First Quarter-	31	0	26	Afternoon.
In Perigee - -	6	11	0	Afternoon.
In Apogee - -	18	9	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	15	N.27	9	2	N.41	17	18	S.44	25	4	N.12
2	17	34	10	1	S.56	18	17	56	26	8	12
3	18	40	11	6	18	19	16	22	27	11	51
4	18	36	12	10	13	20	14	5	28	14	57
5	17	18	13	13	31	21	11	11	29	17	16
6	14	50	14	16	4	22	7	46	30	18	36
7	11	23	15	17	48	23	3	57	31	18	50
8	7	13	16	18	41	24	0	N.5			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Brest add 18 m. | Devonport add 17 m. | Portsmouth add 4 m.

MARCH, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.	
B.	1	3 10 17	0	3 33 16	7	4 38 14	10	4 59 14	7	6 9 18	1	6 29 17	9	6.9
M.	2	3 58 16	1	4 25 15	6	5 24 14	3	5 52 13	11	6 53 17	5	7 19 17	0)
Tu.	3	4 53 15	0	5 25 14	9	6 23 13	7	6 59 13	3	7 49 16	8	8 24 16	4	8.9
W.	4	6 4 14	8	6 46 14	11	7 38 13	3	8 24 13	4	9 7 16	2	9 52 16	1	9.9
Th.	5	7 29 15	5	8 8 16	0	9 11 13	7	9 53 14	0	10 36 16	3	11 20 16	6	10.9
F.	6	8 44 16	9	9 14 17	6	10 30 14	5	11 3 14	11	12 0 16	11	—	—	11.9
S.	7	9 42 18	2	10 9 18	10	11 31 15	5	11 57 15	11	0 52 17	5	1 0 18	0	12.9
B.	8	10 35 19	4	11 1 19	9	—	—	0 21 16	4	1 28 18	7	1 54 19	1	0
M.	9	11 26 20	0	11 50 20	2	0 45 16	8	1 9 16	11	2 17 19	6	2 39 19	10	14.9
Tu.	10	—	—	0 13 20	2	1 31 17	1	1 52 17	2	3 2 20	2	3 22 20	3	15.9
W.	11	0 36 20	1	0 58 19	11	2 13 17	2	2 34 17	0	3 44 20	4	4 4 20	3	16.9
Th.	12	1 20 19	7	1 41 19	3	2 53 16	10	3 12 16	8	4 24 20	2	4 44 19	11	17.9
F.	13	2 1 18	10	2 20 18	4	3 31 16	4	3 50 15	11	5 4 19	7	5 23 19	2	18.9
S.	14	2 40 17	8	3 0 17	0	4 9 15	6	4 28 15	1	5 41 18	9	5 59 18	3	19.9
B.	15	3 20 16	4	3 41 15	8	4 49 14	7	5 10 14	1	6 20 17	9	6 41 17	3	20.9
M.	16	4 3 15	0	4 26 14	4	5 34 13	8	6 0 13	2	7 5 16	8	7 29 16	3	21.9
Tu.	17	4 56 13	10	5 30 13	6	6 30 12	10	7 6 12	6	7 58 15	9	8 33 15	5	22.9
W.	18	6 8 13	4	6 47 13	6	7 46 12	5	8 30 12	5	9 13 15	2	9 54 15	1	23.0
Th.	19	7 28 13	10	8 5 14	3	9 12 12	7	9 52 12	10	10 37 15	2	11 17 15	3	24.9
F.	20	8 37 14	10	9 3 15	4	10 27 13	2	10 57 13	7	11 51 15	6	—	—	25.9
S.	21	9 25 15	10	9 45 16	5	11 22 13	11	11 41 14	4	0 22 15	11	0 49 16	4	26.9
B.	22	10 4 16	11	10 23 17	4	12 0 14	8	—	—	1 11 16	9	1 30 17	2	27.9
M.	23	10 41 17	9	10 59 18	2	0 17 15	0	0 34 15	4	1 49 17	7	2 6 18	0	28.9
Tu.	24	11 18 18	5	11 36 18	8	0 51 15	7	1 8 15	10	2 22 18	4	2 37 18	8	29.9
W.	25	11 54 18	10	—	—	1 24 16	0	1 40 16	2	2 54 18	11	3 11 19	2	1.2
Th.	26	0 12 18	11	0 31 19	0	1 56 16	3	2 12 16	3	3 26 19	3	3 42 19	5	2.2
F.	27	0 50 19	0	1 9 18	11	2 29 16	3	2 46 16	3	3 58 19	5	4 16 19	5	3.2
S.	28	1 28 18	9	1 48 18	6	3 2 16	2	3 19 16	0	4 34 19	4	4 51 19	2	4.2
B.	29	2 8 18	3	2 30 17	10	3 37 15	9	3 57 15	6	5 10 19	0	5 29 18	8	5.2
M.	30	2 52 17	4	3 15 16	10	4 18 15	2	4 40 14	9	5 49 18	4	6 12 18	0	6.2
Tu.	31	3 41 16	4	4 9 15	9	5 5 14	5	5 34 14	1	6 37 17	7	7 3 17	2	7.2
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	12 28	Sub.	9	10 36	Sub.	17	8 22	Sub.	25	5 57	Sub.
2	12 15		10	10 20		18	8 4		26	5 39	
3	12 2		11	10 4		19	7 46		27	5 20	
4	11 49		12	9 47		20	7 28		28	5 2	
5	11 35		13	9 31		21	7 10		29	4 43	
6	11 21		14	9 14		22	6 52		30	4 25	
7	11 6		15	8 57		23	6 34		31	4 7	
8	10 51		16	8 39		24	6 15				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.
B 2

MARCH, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Mon.	1	5 39	3 55	10 8	4 15	10 6	10 35	18 8	11 1	18 8	7 31	12 8	7 56	12 1
Tu.	2	6 34	4 38	10 4	5 5	10 2	11 32	17 8	—	—	8 24	11 11	8 55	11 1
W.	3	7 32	5 34	10 0	6 6	9 10	0 7	17 2	0 44	16 9	9 30	11 3	10 9	11 4
Th.	4	8 31	6 45	9 10	7 33	9 11	1 21	16 7	2 1	16 8	10 53	11 3	11 36	11 3
F.	5	9 31	8 19	10 0	9 0	10 3	2 43	17 0	3 22	17 8	—	—	0 14	11 10
S.	6	10 30	9 37	10 6	10 12	10 11	3 58	18 3	4 32	19 2	0 49	12 3	1 23	12 11
Mon.	7	11 26	10 42	11 3	11 8	11 7	5 0	19 11	5 25	20 8	1 52	13 6	2 20	14 5
Tu.	8	morn.	11 33	11 11	11 57	12 1	5 49	21 3	6 14	21 8	2 46	14 5	3 9	14 10
W.	9	0 21	—	—	0 21	12 2	6 38	22 0	7 1	22 11	3 31	15 2	3 53	15 1
Th.	10	1 14	0 43	12 3	1 5	12 3	7 23	22 6	7 45	22 6	4 15	15 6	4 36	15 1
F.	11	2 6	1 27	12 3	1 48	12 2	8 7	22 4	8 27	22 2	4 56	15 6	5 16	15 1
S.	12	2 56	2 8	12 0	2 29	11 9	8 47	21 10	9 6	21 3	5 37	14 11	5 57	14 1
Mon.	13	3 45	2 49	11 7	3 8	11 4	9 26	20 8	9 45	20 1	6 17	14 1	6 37	13 1
Tu.	14	4 34	3 27	11 1	3 46	10 10	10 4	19 4	10 24	18 8	6 58	13 2	7 20	12 1
W.	15	5 23	4 5	10 6	4 25	10 3	10 46	17 11	11 13	17 2	7 42	12 1	8 6	11 1
Th.	16	6 12	4 47	9 11	5 12	9 8	11 42	16 6	—	—	8 32	11 2	9 1	10 1
F.	17	7 0	5 39	9 6	6 13	9 4	0 14	15 11	0 51	15 6	9 37	10 5	10 16	10 1
S.	18	7 47	6 53	9 3	7 38	9 3	1 27	15 3	2 5	15 2	10 57	10 2	11 37	10 1
Mon.	19	8 34	8 20	9 4	8 59	9 6	2 44	15 5	3 21	15 10	—	—	0 14	10 1
Tu.	20	9 20	9 34	9 9	10 5	10 0	3 55	16 5	4 26	17 1	0 46	10 11	1 16	11 1
W.	21	10 5	10 31	10 3	10 52	10 6	4 51	17 7	5 10	18 2	1 41	11 9	2 2	12 1
Th.	22	10 50	11 11	10 9	11 29	11 0	5 28	18 9	5 45	19 3	2 22	12 7	2 41	13 1
F.	23	11 35	11 47	11 2	—	—	6 3	19 8	6 20	20 0	2 59	13 4	3 16	13 1
S.	24	0 20	0 4	11 4	0 21	11 6	6 38	20 4	6 55	20 7	3 31	13 11	3 47	14 1
Mon.	25	1 6	0 37	11 7	0 52	11 8	7 11	20 10	7 28	21 1	4 3	14 5	4 19	14 1
Tu.	26	1 54	1 8	11 8	1 25	11 8	7 45	21 2	8 2	21 2	4 35	14 8	4 52	14 1
W.	27	2 44	1 43	11 7	2 1	11 6	8 19	21 2	8 36	21 0	5 9	14 7	5 26	14 1
Th.	28	3 36	2 18	11 5	2 36	11 4	8 54	20 9	9 13	20 5	5 44	14 2	6 4	13 1
F.	29	4 30	2 55	11 3	3 15	11 1	9 33	20 0	9 54	19 6	6 25	13 7	6 48	13 1
S.	30	5 26	3 36	10 10	3 57	10 8	10 15	18 11	10 41	18 5	7 12	12 11	7 37	12 1
Mon.	31	6 24	4 20	10 5	4 47	10 3	11 13	17 10	11 48	17 4	8 6	12 1	8 38	11 1

Half Mean Spring } 5 ft. 9 in.

10 ft. 5 in.

7 ft. 2 in.

Phases of the Moon.

	D.	H.	M.	
First Quarter	2	4	49	Morning.
Full - - - -	8	8	22	Afternoon.
Last Quarter -	16	3	28	Morning.
New - - - -	24	6	59	Morning.
First Quarter	31	0	26	Afternoon.
In Perigee - -	6	11	0	Afternoon.
In Apogee - -	18	9	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'
1	15	N. 27	7	18	S. 44
2	17	34	8	17	56
3	18	40	9	16	22
4	18	36	0	14	5
5	17	18	1	11	11
6	14	50	2	7	46
7	11	23	3	3	57
8	7	13	4	0	N. 5

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

BRITISH AND IRISH PORTS.

MARCH, 1868.

DAY.		NORTH SHIELDS.		LEITH.		THURSO.		T's Age				
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	
7 33 11 7	8 0 11 2	6 29 14 5	6 55 14 0	0 31 11 3	0 47 10 10	6						
8 30 10 9	9 3 10 5	7 24 13 7	7 58 13 2	1 16 10 6	1 48 10 2	7						
9 40 10 2	10 22 10 1	8 34 12 11	9 14 12 7	2 25 9 10	3 7 9 9	8						
1 5 10 3	11 49 10 6	10 0 12 10	10 42 13 1	3 56 9 9	4 42 9 10	9						
— — — —	0 28 10 10	11 21 13 5	11 56 13 10	5 23 10 1	5 58 10 6	10						
1 2 11 2	1 33 11 8	— — — —	0 27 14 5	6 29 11 2	6 53 11 11	11						
1 59 12 3	2 24 12 10	0 53 15 2	1 19 15 10	7 15 12 8	7 36 12 4	12						
1 47 13 4	3 10 13 9	1 43 16 5	2 7 16 11	7 57 13 11	8 19 14 3	C						
3 32 14 1	3 54 14 3	2 30 17 3	2 52 17 7	8 40 14 6	9 0 14 6	14						
4 15 14 5	4 37 14 5	3 12 17 7	3 33 17 7	9 21 14 6	9 43 14 4	15						
4 59 14 2	5 19 13 11	3 54 17 4	4 14 17 10	10 4 14 1	10 25 13 9	16						
5 40 13 8	6 1 13 4	4 35 16 9	4 55 16 5	10 46 13 4	11 6 12 11	17						
6 21 13 0	6 40 12 7	5 15 16 0	5 35 15 6	11 26 12 4	11 48 11 11	18						
7 0 12 2	7 22 11 7	5 56 15 0	6 18 14 5	— — — —	0 10 11 3	19						
7 45 11 0	8 11 10 6	6 41 13 10	7 6 13 3	0 33 10 8	0 57 10 1	20						
8 39 9 11	9 11 9 6	7 34 12 9	8 4 12 3	1 24 9 8	1 55 9 2	21						
9 49 9 3	10 28 9 2	8 41 11 11	9 22 11 9	2 33 8 10	3 15 8 8	22						
11 10 9 3	11 50 9 4	10 4 11 2	10 43 11 10	4 2 8 7	4 43 8 7	23						
— — — —	0 28 9 7	11 21 12 1	11 53 12 5	5 22 8 11	5 55 9 1	24						
1 0 9 11	1 28 10 3	— — — —	0 22 12 10	6 24 7 6	6 46 10 0	25						
1 1 5 10 7	2 10 11 0	0 45 13 3	1 3 13 9	7 3 10 7	7 19 11 2	26						
2 2 28 11 5	2 44 11 10	1 22 14 11	1 40 14 9	7 34 11 8	7 49 12 2	27						
3 3 0 12 3	3 16 12 7	1 57 15 3	2 13 15 7	8 3 12 7	8 18 12 11	28						
4 3 32 12 10	3 47 13 1	2 30 15 11	2 46 16 2	8 34 13 2	8 49 13 4	29						
5 4 3 13 3	4 19 13 4	3 1 16 4	3 15 16 5	9 4 13 5	9 20 13 6	30						
6 4 36 13 5	4 54 13 11	3 31 16 6	3 49 16 5	9 38 13 5	9 56 13 4	31						
7 5 12 13 3	5 30 13 1	4 7 16 4	4 25 16 2	10 14 13 2	10 33 12 11	32						
8 5 49 12 11	6 8 12 9	4 43 16 0	5 2 15 9	10 53 12 8	11 15 12 3	33						
9 6 28 12 6	6 50 12 2	5 22 15 6	5 45 15 1	11 38 11 11	— — — —	34						
0 7 13 11 10	7 40 11 5	6 9 14 8	6 36 14 2	0 2 11 6	0 28 11 0	35						
1 8 11 10 11	8 45 10 6	7 5 13 9	7 40 13 4	0 57 10 8	1 30 10 3	36						
Mean Spring } 6ft. 8in.				8ft. 2in.				6ft. 7in.				

Mean Spring? 6ft. 8in.

8ft. 2in.

6ft. 7in.

of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
17	8 22		25	5 57	
18	8 4		26	6 39	
19	7 46		27	5 20	
20	7 28		28	5 2	
21	7 10		29	4 43	
22	6 52		30	4 25	
23	6 34		31	4 7	
24	6 15				

at Place; if Greenwich or Railway Time be required—
ITH add 13 m. | THURSO add 14 m.

MARCH, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.						
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
S.	1	5a39	3	52	9	2	4	16	9	1	3	3	23	2	3	27	22	7	10	14	18	1	10	38	17	6				
M.	2	6 34	4	41	8	11	5	9	8	9	3	52	21	10	4	23	21	3	11	3	16	10	11	29	16	2				
Tu.	3	7 32	5	40	8	7	6	17	8	5	4	58	20	7	5	38	20	5	—	—	—	—	0	1	15	11				
W.	4	8 31	7	0	8	4	7	45	8	4	6	27	20	6	7	15	20	11	0	41	15	10	1	30	16	1				
Th.	5	9 31	8	28	8	6	9	6	8	9	7	56	21	7	8	34	22	4	2	17	16	7	2	58	17	3				
F.	6	10 30	9	42	9	0	10	12	9	3	9	6	23	5	9	33	24	5	3	37	18	4	4	10	19	4				
S.	7	11 26	10	39	9	6	11	6	9	9	9	59	25	5	10	23	26	3	4	41	20	3	5	9	21	1				
S.	8	morn.	11	32	9	11	11	57	10	1	10	46	26	10	11	10	27	4	5	36	21	8	6	2	22	2				
M.	9	0 21	—	—	—	—	0	21	10	2	11	33	27	9	11	55	28	0	6	25	22	7	6	47	22	10				
Tu.	10	1 14	0	44	10	3	1	6	10	4	—	—	—	—	0	17	28	1	7	8	22	11	7	29	23	9				
W.	11	2 6	1	28	10	3	1	48	10	3	0	39	28	0	0	59	27	8	7	49	22	5	8	9	23	0				
Th.	12	2 56	2	8	10	2	2	27	10	0	1	19	27	2	1	38	26	6	8	29	21	6	8	48	20	11				
F.	13	3 45	2	46	9	10	3	5	9	7	1	56	25	9	2	15	25	0	9	7	20	3	9	25	19	5				
S.	14	4 34	3	23	9	5	3	42	9	2	2	34	24	1	2	53	23	2	9	43	18	8	10	2	17	10				
S.	15	5 23	4	2	9	0	4	24	8	9	3	13	22	3	3	35	21	4	10	22	17	0	10	42	16	2				
M.	16	6 12	4	47	8	6	5	14	8	3	4	0	20	5	4	29	19	7	11	4	15	4	11	32	14	9				
Tu.	17	7 0	5	47	8	1	6	23	7	11	5	5	19	0	5	46	18	8	—	—	—	—	0	6	14	4				
W.	18	7 47	7	4	7	9	7	46	7	10	6	33	18	9	7	16	18	11	0	45	14	3	1	31	14	4				
Th.	19	8 34	8	27	7	11	9	2	8	1	7	55	19	4	8	31	20	0	2	16	14	8	2	54	15	2				
F.	20	9 20	9	34	8	4	10	1	8	6	9	0	20	9	9	24	21	5	3	29	15	10	3	56	16	7				
S.	21	10 5	10	22	8	8	10	42	8	10	9	43	22	3	10	1	23	0	4	20	17	4	4	42	18	0				
S.	22	10 50	11	1	9	0	11	20	9	2	10	18	23	8	10	35	24	2	5	3	18	9	5	24	19	3				
M.	23	11 35	11	39	9	4	11	57	9	5	10	52	24	8	11	9	25	2	5	43	19	9	6	1	20	3				
Tu.	24	0a20	—	—	—	—	0	14	9	7	11	26	25	7	11	43	26	0	6	18	20	7	6	34	21	0				
W.	25	1 6	0	31	9	8	0	47	9	9	11	59	26	2	—	—	—	—	6	50	21	2	7	7	21	4				
Th.	26	1 54	1	5	9	10	1	23	9	10	0	16	26	5	0	34	26	5	7	24	21	5	7	41	21	3				
F.	27	2 44	1	41	9	10	1	58	9	10	0	52	26	4	1	9	26	2	7	58	21	2	8	16	20	11				
S.	28	3 36	2	16	9	10	2	34	9	9	1	26	25	10	1	44	25	5	8	35	20	7	8	55	20	2				
S.	29	4 30	2	53	9	7	3	13	9	5	2	3	24	10	2	23	24	3	9	15	19	7	9	35	19	0				
M.	30	5 26	3	33	9	3	3	57	9	1	2	44	23	7	3	8	22	11	9	57	18	4	10	21	17	9				
Tu.	31	6 24	4	24	8	11	4	52	8	9	3	35	22	2	4	6	21	5	10	47	17	1	11	14	16	5				
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.								10ft. 6in.															

Phases of the Moon.				Moon's Declination at Noon.															
	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
First Quarter -	2	4	49	Morning.	1	15	N.27		9	2	N.41		17	18	S.44		25	4	N.13
Full - - - - -	8	8	22	Afternoon.	2	17	34		10	18	56		18	17	56		26	8	12
Last Quarter -	16	3	28	Morning.	3	18	40		11	6	18		19	16	22		27	11	5
New - - - - -	24	6	59	Morning.	4	18	36		12	10	13		20	14	5		28	14	5
First Quarter -	31	0	26	Afternoon.	5	17	18		13	13	31		21	11	11		29	17	10
					6	14	50		14	16	4		22	7	46		30	18	3
In Perigee - -	6	11	0	Afternoon.	7	11	23		15	17	48		23	3	57		31	18	5
In Apogee - -	18	9	0	Afternoon.	8	7	13		16	18	41		24	0	N. 5				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

MARCH, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	D.								
S.	1	10	43	32	10	11	5	31	9	2	3	14	3	2	28	13	11	3	2	9	10	3	27	9	8	6.9
M.	2	11	30	30	8	12	0	29	7	2	57	13	7	3	29	13	2	3	55	9	5	4	28	9	2	D
Tu.	3	—	—	—	—	0	37	29	4	4	6	12	11	4	47	12	10	5	4	9	0	5	41	8	11	8.9
W.	4	1	19	29	3	2	6	29	7	5	33	12	11	6	16	13	2	6	22	9	0	7	3	9	2	9.9
Th.	5	2	50	30	4	3	8	31	4	6	55	13	6	7	30	13	11	7	42	9	5	8	19	9	8	10.9
F.	6	4	13	32	10	4	49	34	5	8	2	14	6	8	29	15	1	8	54	10	0	9	25	10	4	11.9
S.	7	5	22	35	11	5	50	37	3	8	54	15	8	9	17	16	2	9	53	10	8	10	17	11	0	12.9
S.	8	6	17	38	4	6	53	39	1	9	41	16	7	10	4	16	11	10	38	11	3	11	0	11	5	○
M.	9	7	7	39	8	7	30	40	2	10	25	17	1	10	45	17	3	11	22	11	7	11	43	11	8	14.9
Tu.	10	7	52	40	4	8	13	40	1	11	4	17	3	11	24	17	2	—	—	—	—	0	5	11	7	15.9
W.	11	8	32	39	9	8	51	39	2	11	45	16	11	—	—	—	—	0	27	11	6	0	48	11	5	16.9
Th.	12	9	9	38	5	9	26	37	7	0	6	16	8	0	27	16	3	1	9	11	3	1	30	11	0	17.9
F.	13	9	43	36	5	10	0	35	2	0	48	15	10	1	9	15	4	1	50	10	9	2	9	10	5	18.9
S.	14	10	16	33	10	10	31	32	5	1	30	14	10	1	51	14	3	2	30	10	2	2	51	9	10	19.9
S.	15	10	49	31	0	11	9	29	7	2	14	13	9	2	38	13	2	3	13	9	7	3	37	9	3	20.9
M.	16	11	34	28	5	—	—	—	—	3	5	12	8	3	36	12	3	4	4	8	11	4	35	8	8	○
Tu.	17	0	7	27	5	0	42	26	9	4	14	11	11	4	55	11	9	5	10	8	6	5	46	8	4	22.9
W.	18	1	24	26	7	2	7	26	8	5	37	11	10	6	17	11	11	6	26	8	5	7	5	8	6	23.9
Th.	19	2	49	27	2	3	27	27	11	6	55	12	2	7	27	12	6	7	42	8	8	8	15	8	11	24.9
F.	20	4	3	28	11	4	34	29	11	7	56	12	10	8	18	13	3	8	47	9	1	9	13	9	4	25.9
S.	21	4	59	31	2	5	22	32	4	8	39	13	9	8	58	14	2	9	35	9	7	9	56	9	10	26.9
S.	22	5	44	33	5	6	5	34	5	9	14	14	7	9	30	14	11	10	14	10	1	10	30	10	4	27.9
M.	23	6	24	35	2	6	42	35	11	9	47	15	3	10	3	15	7	10	44	10	6	11	0	10	8	28.9
Tu.	24	7	0	36	6	7	17	37	1	10	19	15	10	10	34	16	0	11	16	10	10	11	31	11	0	●
W.	25	7	34	37	7	7	51	37	10	10	48	16	2	11	3	16	3	11	47	11	0	—	—	—	—	1.2
Th.	26	8	8	37	11	8	25	37	10	11	19	16	3	11	37	16	2	0	4	11	0	0	22	11	0	2.2
F.	27	8	41	37	8	8	58	37	4	11	55	16	0	—	—	—	—	0	40	11	0	0	58	10	11	3.2
S.	28	9	15	36	11	9	32	36	3	0	14	15	10	0	35	15	8	1	17	10	9	1	37	10	7	4.2
S.	29	9	50	35	5	10	8	34	5	0	57	15	4	1	20	14	11	1	58	10	5	2	20	10	2	5.2
M.	30	10	27	33	4	10	49	32	3	1	43	14	6	2	9	14	1	2	43	10	0	3	8	9	9	6.2
Tu.	31	11	14	31	1	11	45	30	2	2	38	13	9	3	11	13	4	3	37	9	6	4	10	9	3	D
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	28	Sub.	9	10	36	Sub.	17	8	22	Sub.	25	5	57	Sub.
2	12	15		10	10	20		18	8	4		26	5	39	
3	12	2		11	10	4		19	7	46		27	5	20	
4	11	49		12	9	47		20	7	28		28	5	2	
5	11	35		13	9	31		21	7	10		29	4	43	
6	11	21		14	9	14		22	6	52		30	4	25	
7	11	6		15	8	57		23	6	34		31	4	7	
8	10	51		16	8	39		24	6	15					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MARCH, 1868.

WEEK DAY.	MONTH DAY	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
●	1	5 39	2 45	8 10	3 11	8 8	—	—	0 18	6 2	9 32	9 2	10 3	8 11
M.	2	6 34	3 39	8 6	4 10	8 4	0 54	5 11	1 33	5 9	10 38	8 8	11 15	8 6
Tu.	3	7 32	4 45	8 3	5 22	8 2	2 17	5 8	2 59	5 9	11 55	8 6	—	—
W.	4	8 31	6 3	8 2	6 47	8 2	3 41	5 11	4 20	6 3	0 37	8 7	1 21	8 8
Th.	5	9 31	7 28	8 3	8 4	8 5	4 53	6 6	5 23	6 8	2 1	8 11	2 37	9 3
F.	6	10 30	8 36	8 9	9 3	9 0	5 48	6 11	6 13	7 3	3 7	9 9	3 33	10 3
S.	7	11 26	9 29	9 4	9 53	9 6	6 38	7 7	7 4	7 10	3 56	10 9	4 19	11 3
●	8	morn.	10 16	9 8	10 39	9 10	7 29	8 0	7 54	8 2	4 43	11 7	5 7	11 10
M.	9	0 21	11 1	9 11	11 22	9 11	8 15	8 4	8 35	8 5	5 30	12 1	5 52	12 2
Tu.	10	1 14	11 42	9 11	—	—	8 54	8 5	9 14	8 3	6 12	12 2	6 32	12 0
W.	11	2 6	0 2	9 10	0 23	9 9	9 33	8 1	9 52	7 11	6 53	11 10	7 14	11 6
Th.	12	2 56	0 45	9 8	1 6	9 7	10 10	7 8	10 29	7 5	7 34	11 2	7 53	10 9
F.	13	3 45	1 26	9 5	1 47	9 3	10 48	7 2	11 9	6 10	8 11	10 4	8 31	9 11
S.	14	4 34	2 9	9 1	2 32	8 10	11 33	6 6	—	—	8 52	9 6	9 16	9 1
●	15	5 23	2 56	8 7	3 20	8 4	0 1	6 1	0 33	5 9	9 44	8 8	10 13	8 4
M.	16	6 12	3 47	8 2	4 16	8 0	1 7	5 6	1 43	5 4	10 45	8 0	11 23	7 10
Tu.	17	7 0	4 52	7 10	5 28	7 9	2 26	5 3	3 6	5 3	—	—	0 1	7 9
W.	18	7 47	6 7	7 9	6 48	7 9	3 45	5 5	4 21	5 7	0 41	7 9	1 22	7 13
Th.	19	8 34	7 27	7 9	8 1	7 11	4 54	5 9	5 21	5 11	2 0	8 0	2 34	8 5
F.	20	9 20	8 31	8 1	8 54	8 3	5 45	6 1	6 5	6 3	3 3	8 7	3 25	8 12
S.	21	10 5	9 13	8 6	9 32	8 9	6 23	6 6	6 42	6 9	3 43	9 3	4 0	9 8
●	22	10 50	9 49	8 11	10 6	9 1	7 0	7 0	7 18	7 2	4 15	10 10	4 33	10 4
M.	23	11 35	10 23	9 3	10 39	9 4	7 36	7 4	7 53	7 6	4 49	10 7	5 6	10 11
Tu.	24	0 20	10 55	9 5	11 10	9 6	8 9	7 7	8 24	7 9	5 23	11 1	5 40	11 5
W.	25	1 6	11 25	9 6	11 41	9 6	8 38	7 10	8 53	7 10	5 55	11 4	6 11	11 5
Th.	26	1 54	11 57	9 6	—	—	9 9	7 9	9 26	7 8	6 27	11 4	6 45	11 3
F.	27	2 44	0 15	9 6	0 34	9 5	9 42	7 7	9 59	7 5	7 3	11 1	7 22	10 10
S.	28	3 36	0 53	9 5	1 13	9 4	10 17	7 3	10 36	7 1	7 40	10 7	7 59	10 4
●	29	4 30	1 35	9 3	1 59	9 1	10 58	6 11	11 22	6 8	8 21	10 0	8 44	9 8
M.	30	5 26	2 23	8 11	2 51	8 9	11 57	6 4	—	—	9 11	9 4	9 44	9 1
Tu.	31	6 24	3 20	8 7	3 53	8 5	0 33	6 0	1 13	5 10	10 19	8 9	10 58	8 7

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

Phases of the Moon.

Moon's Declina

	D.	H.	M.	
First Quarter	2	4	49	Morning.
Full - - - -	8	8	22	Afternoon.
Last Quarter	16	3	28	Morning.
New - - - -	24	6	59	Morning.
First Quarter	31	0	26	Afternoon.
In Perigee - -	6	11	0	Afternoon.
In Apogee - -	18	9	0	Afternoon.

M.D.	°	'	M.D.	°	'
1	15	N.27	9	2	N.41
2	17	34	10	1	S.56
3	18	40	11	6	18
4	18	36	12	10	13
5	17	18	13	13	31
6	14	50	14	16	4
7	11	23	15	17	48
8	7	13	16	18	41

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

MARCH, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
S.	1	8 52 12 5	9 19 11 11	9 5 10 3	9 30 9 11	9 21 11 3	9 44 11 0	6.9						
M.	2	9 49 11 6	10 24 11 2	9 56 9 8	10 24 9 5	10 12 10 8	10 47 10 4	7.9						
Tu.	3	11 3 11 1	11 48 11 2	11 2 9 3	11 45 9 3	11 23 10 1	—	8.9						
W.	4	—	0 32 11 5	—	0 31 9 5	0 3 10 0	0 44 10 2	9.9						
Th.	5	1 13 11 9	1 48 12 3	1 14 9 8	1 55 10 0	1 24 10 5	2 4 10 8	10.9						
F.	6	2 19 12 11	2 47 13 7	2 33 10 5	3 4 10 10	2 43 11 2	3 19 11 8	11.9						
S.	7	3 14 14 3	3 39 14 9	3 33 11 4	4 0 11 9	3 51 12 1	4 20 12 6	12.9						
S.	8	4 3 15 3	4 26 15 8	4 25 12 1	4 50 12 4	4 47 12 10	5 13 13 0	0						
M.	9	4 48 16 0	5 10 16 2	5 13 12 7	5 36 12 8	5 36 13 2	5 57 13 3	14.9						
Tu.	10	5 32 16 3	5 54 16 1	5 59 12 8	6 21 12 8	6 19 13 4	6 41 13 4	15.9						
W.	11	6 15 15 11	6 35 15 7	6 41 12 6	7 1 12 4	7 2 13 3	7 22 13 1	16.9						
Th.	12	6 55 15 2	7 15 14 8	7 20 12 0	7 39 11 8	7 41 12 10	8 0 12 7	17.9						
F.	13	7 35 14 2	7 55 13 7	7 58 11 4	8 16 11 0	8 17 12 3	8 34 11 11	18.9						
S.	14	8 16 12 11	8 38 12 3	8 33 10 7	8 52 10 1	8 52 11 6	9 9 11 2	19.9						
S.	15	9 2 11 6	9 27 10 11	9 13 9 8	9 34 9 4	9 28 10 9	9 50 10 4	20.9						
M.	16	9 54 10 6	10 30 10 1	9 58 9 0	10 30 8 8	10 17 9 11	10 52 9 7	21.9						
Tu.	17	11 10 9 11	11 53 9 11	11 8 8 6	11 50 8 5	11 28 9 4	—	22.9						
W.	18	—	0 34 10 1	—	0 32 8 6	0 7 9 2	0 45 9 3	23.9						
Th.	19	1 12 10 4	1 45 10 8	1 13 8 8	1 50 8 11	1 23 9 5	1 59 9 8	24.9						
F.	20	2 14 11 2	2 37 11 7	2 24 9 2	2 52 9 6	2 34 10 0	3 4 10 4	25.9						
S.	21	2 58 12 1	3 18 12 4	3 14 9 10	3 36 10 3	3 29 10 8	3 52 11 0	26.9						
S.	22	3 35 13 0	3 52 13 5	3 55 10 7	4 14 10 10	4 13 11 4	4 34 11 7	27.9						
M.	23	4 9 13 10	4 26 14 2	4 32 11 1	4 49 11 4	4 54 11 10	5 12 12 1	28.9						
Tu.	24	4 42 14 6	4 57 14 9	5 6 11 7	5 23 11 9	5 29 12 2	5 45 12 4	29.9						
W.	25	5 13 15 0	5 31 15 1	5 40 11 10	5 58 11 11	6 1 12 6	6 18 12 7	1.2						
Th.	26	5 49 15 1	6 7 15 0	6 16 11 11	6 33 11 11	6 36 12 8	6 54 12 8	2.2						
F.	27	6 24 14 11	6 42 14 8	6 50 11 10	7 8 11 8	7 12 12 7	7 29 12 6	3.2						
S.	28	7 1 14 5	7 22 14 1	7 27 11 6	7 46 11 3	7 47 12 5	8 6 12 3	4.2						
S.	29	7 44 13 8	8 7 13 3	8 5 11 0	8 25 10 9	8 25 12 0	8 44 11 9	5.2						
M.	30	8 33 12 8	9 2 12 1	8 47 10 5	9 15 10 1	9 4 11 5	9 28 11 1	6.2						
Tu.	31	9 32 11 8	10 7 11 4	9 40 9 9	10 9 9 6	9 55 10 9	10 30 10 5	7.2						

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	12 28	Sub.	9	10 36	Sub.	17	8 22	Sub.	25	5 57	Sub.
2	12 15		10	10 20		18	8 4		26	5 39	
3	12 2		11	10 4		19	7 46		27	5 20	
4	11 49		12	9 47		20	7 28		28	5 2	
5	11 35		13	9 31		21	7 10		29	4 43	
6	11 21		14	9 14		22	6 52		30	4 25	
7	11 6		15	8 57		23	6 34		31	4 7	
8	10 51		16	8 39		24	6 15				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	7 22	9 45	14 3	10 32	14 3	11 16	12 6	11 57	12 11	5 0	10 6	5 38	10 4
Th.	2	8 19	11 18	14 6	—	—	—	—	0 42	12 6	6 23	10 3	7 7	10 5
F.	3	9 14	0 3	15 0	0 41	15 8	1 27	13 4	2 11	13 1	7 50	10 9	8 31	11 1
S.	4	10 8	1 14	16 6	1 43	17 4	2 49	14 1	3 24	14 0	9 5	11 7	9 35	12 3
♄.	5	11 1	2 8	18 1	2 31	18 10	3 53	15 0	4 21	14 10	10 3	12 4	10 26	12 8
M.	6	11 52	2 53	19 6	3 15	20 0	4 47	15 9	5 12	15 6	10 49	12 11	11 11	13 1
Tu.	7	morn.	3 36	20 3	3 57	20 4	5 35	16 3	5 56	16 0	11 32	13 3	11 53	13 4
W.	8	0 43	4 18	20 4	4 38	20 2	6 18	16 5	6 38	16 0	—	—	0 14	13 3
Th.	9	1 33	4 57	20 0	5 15	19 7	6 57	16 1	7 13	15 9	0 35	13 2	0 56	13 0
F.	10	2 23	5 33	19 2	5 51	18 8	7 30	15 6	7 47	15 3	1 15	12 10	1 34	12 8
S.	11	3 13	6 9	18 1	6 28	17 4	8 4	14 10	8 20	14 6	1 52	12 5	2 10	12 2
♄.	12	4 3	6 47	16 7	7 8	15 9	8 36	13 11	8 53	13 8	2 29	11 10	2 48	11 6
M.	13	4 52	7 30	15 0	7 52	14 3	9 10	13 0	9 29	12 10	3 8	11 2	3 29	10 10
Tu.	14	5 40	8 18	13 7	8 46	13 1	9 49	12 0	10 14	12 1	3 51	10 5	4 15	10 2
W.	15	6 28	9 20	12 9	9 59	12 8	10 42	11 4	11 16	11 8	4 42	9 10	5 14	9 7
Th.	16	7 14	10 42	12 8	11 21	12 11	11 55	11 1	—	—	5 52	9 6	6 31	9 5
F.	17	7 59	11 59	13 3	—	—	0 37	11 10	1 16	11 6	7 9	9 7	7 46	9 10
S.	18	8 44	0 33	13 9	1 1	14 5	1 54	12 5	2 30	12 2	8 22	10 2	8 52	10 6
♄.	19	9 29	1 28	15 2	1 50	15 10	2 59	13 1	3 26	13 2	9 20	11 10	9 43	11 3
M.	20	10 14	2 9	16 6	2 27	17 3	3 50	14 1	4 14	14 0	10 4	11 6	10 22	11 10
Tu.	21	11 0	2 43	17 10	3 0	18 5	4 37	14 10	4 57	14 9	10 39	12 1	10 56	12 4
W.	22	11 47	3 18	18 10	3 36	19 2	5 16	15 4	5 34	15 4	11 14	12 6	11 32	12 8
Th.	23	0 37	3 55	19 5	4 14	19 6	5 53	15 8	6 12	15 8	11 51	12 10	—	—
F.	24	1 30	4 33	19 7	4 51	19 7	6 30	15 9	6 49	15 9	0 10	12 10	0 30	12 11
S.	25	2 24	5 10	19 5	5 30	19 2	7 6	15 7	7 25	15 6	0 50	12 10	1 10	12 9
♄.	26	3 21	5 50	18 11	6 11	18 6	7 44	15 4	8 4	15 2	1 31	12 8	1 51	12 7
M.	27	4 19	6 34	17 11	6 58	17 3	8 25	14 10	8 46	14 9	2 12	12 5	2 35	12 2
Tu.	28	5 17	7 25	16 7	7 54	15 10	9 9	14 1	9 36	14 1	2 59	11 10	3 25	11 7
W.	29	6 14	8 26	15 3	9 1	14 10	10 4	13 3	10 34	13 6	3 52	11 3	4 23	10 11
Th.	30	7 9	9 40	14 8	10 22	14 8	11 9	12 8	11 49	13 1	4 57	10 8	5 34	10 6

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - - -	7	7	17	Morning.
Last Quarter -	14	10	34	Afternoon.
New - - - - -	22	8	20	Afternoon.
First Quarter -	29	6	18	Afternoon.
<hr/>				
In Perigee - -	3	4	0	Afternoon.
In Apogee - -	15	4	0	Afternoon.
In Perigee - -	29	3	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	
1	17	N.54	9	12	S.22	17	12	S.20	25	16	N.54
2	15	49	10	15	18	18	9	3	26	18	34
3	12	44	11	17	24	19	5	21	27	19	5
4	8	53	12	18	38	20	1	20	28	18	24
5	4	32	13	18	58	21	2	N.51	29	16	35
6	0	S.3	14	18	27	22	6	59	30	13	45
7	4	33	15	17	7	23	10	53			
8	8	44	16	15	3	24	14	16			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
BREST add 18 m. / DEVONPORT add 17 m. / PORTSMOUTH add 4 m.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.																																																																																																																																																																																																																																																				
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																								
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.																																																																																																																																																																																																																																																												
W.	1	4 38 15 3	5 13 14 11	6 6 13 8	6 42 13 5	7 33 16 9	8 10 16 6	8 2	Th.	2	5 53 14 10	6 34 15 1	7 26 13 4	8 14 13 5	8 53 16 3	9 39 16 2	9 2	F.	3	7 16 15 7	7 56 16 2	8 58 13 8	9 40 14 1	10 25 16 4	11 8 16 7	10 2	S.	4	8 30 16 10	8 58 17 6	10 17 14 6	10 49 15 0	11 44 17 0	—	—	11 2	S.	5	9 25 18 0	9 50 18 6	11 17 15 5	11 41 15 9	0 17 17 6	0 44 18 0	12 2	M.	6	10 15 19 0	10 40 19 4	—	0 4 16 2	1 10 18 5	1 36 18 10	13 2	Tu.	7	11 3 19 7	11 26 19 8	0 26 16 5	0 48 16 8	1 57 19 3	2 18 19 7	0	W.	8	11 48 19 8	—	1 9 16 10	1 29 16 11	2 40 19 9	3 0 19 11	15 2	Th.	9	0 10 19 7	0 30 19 5	1 49 16 10	2 9 16 9	3 19 19 11	3 38 19 11	16 2	F.	10	0 50 19 2	1 11 18 10	2 28 16 7	2 45 16 4	3 58 19 9	4 17 19 7	17 2	S.	11	1 31 18 5	1 50 18 0	3 3 16 1	3 21 15 9	4 35 19 4	4 53 18 11	18 2	S.	12	2 9 17 7	2 29 17 0	3 39 15 5	3 58 15 0	5 11 18 7	5 28 18 2	19 2	M.	13	2 50 16 4	3 10 15 9	4 17 14 7	4 38 14 1	5 47 17 9	6 8 17 3	20 2	Tu.	14	3 32 15 2	3 56 14 8	5 0 13 8	5 24 13 3	6 30 16 9	6 54 16 4	21	W.	15	4 22 14 1	4 50 13 9	5 52 13 0	6 23 12 8	7 19 16 0	7 51 15 7	22 2	Th.	16	5 24 13 6	6 0 13 6	7 0 12 6	7 41 12 5	8 27 15 4	9 7 15 3	23 2	F.	17	6 36 13 9	7 12 14 1	8 23 12 6	9 0 12 9	9 47 15 2	10 25 15 4	24 2	S.	18	7 48 14 7	8 17 15 2	9 36 13 1	10 10 13 5	11 3 15 6	11 37 15 10	25 2	S.	19	8 43 15 8	9 5 16 3	10 37 13 10	11 2 14 3	—	0 6 16 2	26 2	M.	20	9 26 16 9	9 46 17 3	11 24 14 7	11 42 14 11	0 31 16 7	0 52 17 0	27 2	Tu.	21	10 5 17 8	10 24 18 1	11 59 15 3	—	1 12 17 5	1 30 17 10	28 2	W.	22	10 42 18 5	11 2 18 8	0 16 15 6	0 33 15 9	1 46 18 3	2 4 18 7	29	Th.	23	11 23 18 11	11 43 19 0	0 51 16 0	1 9 16 3	2 21 18 10	2 40 19 1	0 7	F.	24	—	0 4 19 1	1 1 27 16 4	1 46 16 5	2 57 19 4	3 16 19 5	1 7	S.	25	0 24 19 1	0 46 19 0	2 4 16 5	2 22 16 4	3 34 19 6	3 51 19 6	2 7	S.	26	1 8 18 10	1 30 18 8	2 41 16 3	3 0 16 1	4 11 19 5	4 30 19 4	3 7	M.	27	1 52 18 5	2 16 18 0	3 20 15 11	3 41 15 8	4 50 19 1	5 12 18 10	4 7	Tu.	28	2 41 17 6	3 6 16 11	4 4 15 4	4 29 14 11	5 35 18 6	5 59 18 2	5 7	W.	29	3 33 16 6	4 4 16 0	4 55 14 6	5 26 14 2	6 25 17 9	6 56 17 4	6	Th.	30	4 36 15 6	5 9 15 3	6 0 13 10	6 39 13 7	7 28 17 0	8 5 16 8	7 7
Half Mean Spring } Range.		9ft. 4in.								8ft. 0in.								9ft. 7in.																																																																																																																																																																																																																																																												

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	49	Sub.	9	1	29	Sub.	17	0	34	Add.	25	2	11	Add.
2	3	31		10	1	12		18	0	48		26	2	21	
3	3	13		11	0	56		19	1	1		27	2	31	
4	2	55		12	0	40		20	1	14		28	2	40	
5	2	37		13	0	24		21	1	26		29	2	49	
6	2	20		14	0	9		22	1	38		30	2	57	
7	2	2		15	0	6	Add.	23	1	50					
8	1	45		16	0	20		24	2	1					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.		
W.	1	7 22	5 17	10 0			5 50	9 11			—	—			0 27	16 11			9 13	11 5			9 56	11 3		
Th.	2	8 19	6 32	9 10			7 22	9 11			1 8	16 8			1 50	16 9			10 42	11 4			11 24	11 6		
F.	3	9 14	8 6	10 1			8 47	10 4			2 31	17 2			3 9	17 9			—	—			0 1	11 11		
S.	4	10 8	9 24	10 7			9 57	10 11			3 46	18 6			4 18	19 3			0 26	12 5			1 8	12 11		
♄.	5	11 1	10 27	11 3			10 52	11 6			4 46	19 11			5 9	20 5			1 36	13 5			2 5	13 10		
M.	6	11 52	11 16	11 9			11 39	11 11			5 32	20 11			5 55	21 5			2 27	14 3			2 51	14 7		
Tu.	7	morn.	—	—			0 1	12 1			6 18	21 8			6 40	21 11			3 12	14 10			3 32	15 0		
W.	8	0 43	0 22	12 1			0 42	12 1			7 1	22 0			7 22	22 0			3 53	15 2			4 13	15 3		
Th.	9	1 33	1 3	12 0			1 24	11 11			7 43	21 10			8 1	21 8			4 32	15 2			4 51	14 11		
F.	10	2 23	1 42	11 10			2 1	11 8			8 19	21 4			8 38	21 0			5 9	14 8			5 28	14 4		
S.	11	3 13	2 20	11 5			2 39	11 3			8 56	20 5			9 15	19 10			5 47	13 11			6 6	13 6		
♄.	12	4 3	2 57	11 0			3 16	10 9			9 34	19 3			9 53	18 7			6 26	13 0			6 47	12 7		
M.	13	4 52	3 35	10 6			3 54	10 2			10 14	17 11			10 36	17 3			7 9	12 2			7 32	11 8		
Tu.	14	5 40	4 15	9 11			4 38	9 9			11 3	16 8			11 35	16 2			7 57	11 3			8 24	10 11		
W.	15	6 28	5 4	9 6			5 32	9 4			—	—			0 8	15 8			8 55	10 7			9 31	10 5		
Th.	16	7 14	6 6	9 4			6 48	9 3			0 44	15 5			1 21	15 3			10 11	10 3			10 50	10 4		
F.	17	7 59	7 31	9 4			8 8	9 6			1 58	15 4			2 32	15 9			11 25	10 6			11 58	10 9		
S.	18	8 44	8 44	9 8			9 17	9 11			3 6	16 2			3 38	16 10			—	—			0 29	11 3		
♄.	19	9 29	9 45	10 2			10 11	10 5			4 6	17 5			4 31	18 0			0 56	11 7			1 21	12 1		
M.	20	10 14	10 34	10 8			10 53	10 11			4 53	18 7			5 11	19 1			1 43	12 6			2 4	12 10		
Tu.	21	11 0	11 11	11 2			11 29	11 4			5 28	19 7			5 45	20 0			2 23	13 3			2 41	13 7		
W.	22	11 47	11 46	11 6			—	—			6 3	20 4			6 21	20 8			2 58	13 10			3 15	14 1		
Th.	23	0 237	0 4	11 7			0 22	11 8			6 40	20 11			6 58	21 2			3 32	14 4			3 50	14 7		
F.	24	1 30	0 39	11 9			0 58	11 9			7 17	21 3			7 36	21 4			4 8	14 8			4 27	14 9		
S.	25	2 24	1 17	11 9			1 36	11 8			7 55	21 4			8 14	21 3			4 45	14 9			5 4	14 7		
♄.	26	3 21	1 56	11 7			2 17	11 5			8 34	21 0			8 55	20 8			5 25	14 4			5 46	14 1		
M.	27	4 19	2 38	11 4			2 59	11 2			9 17	20 3			9 40	19 9			6 8	13 9			6 33	13 5		
Tu.	28	5 17	3 22	10 11			3 46	10 9			10 4	19 2			10 31	18 7			6 59	13 0			7 27	12 8		
W.	29	6 14	4 11	10 6			4 39	10 4			11 4	18 1			11 42	17 7			7 58	12 3			8 32	11 11		
Th.	30	7 9	5 12	10 2			5 47	10 0			—	—			0 24	17 3			9 10	11 8			9 51	11 7		

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

	D.	H.	M.	
Full	-	7	7	17 Morning.
Last Quarter	-	14	10	34 Afternoon.
New	-	22	8	20 Afternoon.
First Quarter	-	29	6	18 Afternoon.
<hr/>				
In Perigee	-	3	4	0 Afternoon.
In Apogee	-	15	4	0 Afternoon.
In Perigee	-	29	3	0 Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	N. 54	9	12	S. 22	17	12	S. 20	25	16	N. 54
2	15	49	10	15	18	18	9	3	26	18	54
3	12	44	11	17	24	19	5	21	27	19	5
4	8	53	12	18	38	20	1	20	28	18	24
5	4	32	13	18	58	21	2	N. 51	29	16	35
6	0	S. 3	14	18	27	22	6	59	30	13	45
7	4	33	15	17	7	23	10	53			
8	8	44	16	15	3	24	14	16			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
W.	1	9 24	10 3	10 9	10 2	8 17	13 0	9 2	12 10	2 8	10 0	2 54	9 10	8.2
Th.	2	10 54	10 4	11 36	10 7	9 49	12 11	10 30	13 2	3 45	9 10	4 29	10 0	9.2
F.	3	—	—	0 15	10 11	11 8	13 6	11 43	14 0	5 10	10 2	5 45	10 8	10.2
S.	4	0 50	11 4	1 19	11 9	—	—	0 13	14 6	6 15	11 3	6 39	11 11	11.2
W.	5	1 45	12 3	2 9	12 8	0 40	15 1	1 3	15 8	7 1	12 6	7 21	13 0	12.2
M.	6	2 31	13 1	2 52	13 6	1 26	16 2	1 49	16 7	7 40	13 7	7 59	13 11	13.2
Tu.	7	3 13	13 9	3 33	13 11	2 11	16 11	2 31	17 2	8 19	14 2	8 39	14 3	○
W.	8	3 53	14 1	4 13	14 0	2 50	17 3	3 9	17 2	8 58	14 2	9 18	14 0	15.2
Th.	9	4 33	13 11	4 53	13 8	3 29	17 0	3 48	16 9	9 37	13 9	9 56	13 6	16.2
F.	10	5 12	13 5	5 31	13 1	4 7	16 6	4 26	16 2	10 16	13 1	10 36	12 8	17.2
S.	11	5 51	12 8	6 10	12 4	4 46	15 9	5 5	15 4	10 55	12 2	11 15	11 8	18.2
W.	12	6 29	12 0	6 49	11 6	5 24	14 11	5 45	14 5	11 36	11 2	11 59	10 8	19.2
M.	13	7 11	11 1	7 35	10 7	6 8	13 10	6 31	13 4	—	—	0 23	10 2	20.2
Tu.	14	8 1	10 1	8 31	9 8	6 56	12 10	7 27	12 5	0 48	9 9	1 17	9 4	☾
W.	15	9 4	9 5	9 43	9 3	7 59	12 1	8 35	11 10	1 49	9 0	2 27	8 10	22.2
Th.	16	10 23	9 3	11 2	9 4	9 16	11 9	9 56	11 10	3 10	8 8	3 55	8 8	23.2
F.	17	11 38	9 7	—	—	10 31	12 1	11 5	12 4	4 32	8 10	5 7	9 0	24.2
S.	18	0 12	9 10	0 43	10 2	11 36	12 8	—	—	5 38	9 4	6 4	9 9	25.2
W.	19	1 8	10 6	1 32	10 11	0 3	13 1	0 26	13 7	6 28	10 4	6 46	10 10	26.2
M.	20	1 52	11 3	2 10	11 8	0 46	14 1	1 4	14 6	7 2	11 5	7 17	11 11	27.2
Tu.	21	2 27	12 1	2 43	12 5	1 22	15 0	1 39	15 6	7 31	12 5	7 46	12 10	28.2
W.	22	2 59	12 9	3 15	13 0	1 56	15 10	2 13	16 2	8 2	13 2	8 19	13 5	●
Th.	23	3 32	13 3	3 50	13 5	2 31	16 5	2 48	16 7	8 36	13 6	8 53	13 7	0.7
F.	24	4 9	13 6	4 28	13 6	3 5	16 8	3 23	16 7	9 12	13 7	9 32	13 6	1.7
S.	25	4 47	13 5	5 7	13 3	3 42	16 6	4 2	16 4	9 52	13 4	10 13	13 1	2.7
W.	26</													

[illegible]

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.							
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.		
W.	1	7 22	5	24	8	7	6	4	8	5	4	42	20	10	5	26	20	7	11	49	16	1	—	—	—	—	—	—	—		
Th.	2	8 19	6	49	8	4	7	32	8	5	6	15	20	9	7	1	21	0	0	30	16	1	1	16	16	3	—	—	—		
F.	3	9 14	8	15	8	7	8	53	8	10	7	43	21	9	8	21	22	7	2	4	16	9	2	46	17	6	—	—	—		
S.	4	10 8	9	27	9	1	9	56	9	3	8	52	23	6	9	19	24	5	3	22	18	5	3	54	19	5	—	—	—		
♄.	5	11 1	10	23	9	6	10	48	9	8	9	43	25	2	10	5	25	10	4	23	20	0	4	51	20	8	—	—	—		
M.	6	11 52	11	13	9	9	11	37	9	11	10	27	26	5	10	50	26	10	5	17	21	4	5	41	21	9	—	—	—		
Tu.	7	morn.	11	59	10	0	—	—	—	—	11	12	27	2	11	33	27	5	6	3	22	1	6	24	22	3	—	—	—		
W.	8	0 43	0	21	10	1	0	42	10	1	11	53	27	5	—	—	—	—	6	44	22	3	7	4	22	2	—	—	—		
Th.	9	1 33	1	3	10	1	1	23	10	0	0	13	27	3	0	33	27	0	7	23	21	11	7	41	21	6	—	—	—		
F.	10	2 23	1	41	9	11	1	59	9	10	0	51	26	8	1	10	26	2	8	0	21	1	8	19	20	6	—	—	—		
S.	11	3 13	2	17	9	8	2	35	9	6	1	28	25	5	1	46	24	8	8	37	19	11	8	56	19	3	—	—	—		
♄.	12	4 3	2	54	9	4	3	12	9	1	2	4	23	11	2	23	23	1	9	14	18	7	9	33	17	10	—	—	—		
M.	13	4 52	3	31	8	11	3	52	8	9	2	42	22	3	3	3	21	6	9	52	17	1	10	12	16	5	—	—	—		
Tu.	14	5 40	4	14	8	6	4	39	8	4	3	25	20	7	3	52	19	11	10	34	15	9	10	57	15	1	—	—	—		
W.	15	6 28	5	7	8	2	5	40	8	0	4	23	19	3	4	59	18	11	11	26	14	8	—	—	—	—	—	—	—		
Th.	16	7 14	6	18	7	11	6	57	7	10	5	41	18	9	6	25	18	11	0	1	14	5	0	38	14	5	—	—	—		
F.	17	7 59	7	35	7	11	8	11	8	1	7	4	19	3	7	40	19	9	1	19	14	7	1	59	15	9	—	—	—		
S.	18	8 44	8	45	8	3	9	14	8	5	8	13	20	5	8	40	21	2	2	37	15	7	3	8	16	3	—	—	—		
♄.	19	9 29	9	41	8	8	10	3	8	10	9	5	21	11	9	26	22	8	3	37	17	0	4	1	17	9	—	—	—		
M.	20	10 14	10	24	9	0	10	43	9	2	9	44	23	5	10	1	24	1	4	24	18	5	4	45	19	1	—	—	—		
Tu.	21	11 0	11	2	9	3	11	21	9	5	10	17	24	8	10	35	25	2	5	5	19	8	5	25	20	2	—	—	—		
W.	22	11 47	11	40	9	6	11	59	9	8	10	53	25	7	11	11	25	11	5	44	20	7	6	3	20	11	—	—	—		
Th.	23	0 37	—	—	—	—	0	18	9	9	11	30	26	4	11	49	26	6	6	21	21	3	6	40	21	6	—	—	—		
F.	24	1 30	0	37	9	10	0	57	9	11	—	—	—	—	0	8	26	7	6	59	21	7	7	18	21	6	—	—	—		
S.	25	2 24	1	17	9	11	1	36	9	11	0	27	26	7	0	47	26	5	7	37	21	4	7	57	21	1	—	—	—		
♄.	26	3 21	1	56	9	10	2	16	9	9	1	7	26	2	1	27	25	8	8	18	20	9	8	40	20	5	—	—	—		
M.	27	4 19	2	37	6	8	2	59	9	6	1	47	25	2	2	9	24	7	9	2	19	10	9	24	19	5	—	—	—		
Tu.	28	5 17	3	22	9	4	3	48	9	2	2	33	23	10	2	59	23	2	9	48	18	7	10	14	18	9	—	—	—		
W.	29	6 14	4	16	9	0	4	47	8	10	3	27	22	6	4	0	21	10	10	42	17	4	11	12	16	13	—	—	—		
Th.	30	7 9	5	22	8	8	6	0	8	7	4	38	21	3	5	20	21	1	11	45	16	6	—	—	—	—	—	—	—		
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}								13 ^{ft.} 0 ^{in.}								10 ^{ft.} 6 ^{in.}												
Phases of the Moon.												Moon's Declination at Noon.																			
D. H. M.												M.D. ° ' "																			
Full - - - - - 7 7 17 Morning.												1 17 N. 54																			
Last Quarter - 14 10 34 Afternoon.												2 15 49																			
New - - - - - 22 8 20 Afternoon.												3 12 44																			
First Quarter - 29 6 18 Afternoon.												4 8 53																			
												5 4 32																			
In Perigee - - 3 4 40 Afternoon.												6 0 8. 3																			
In Apogee - - 15 4 0 Afternoon.												7 4 33																			
In Perigee - - 29 3 0 Morning.												8 8 44																			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — for GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
W.	1	—	—	0 24 29 7	3 49 13 0	4 35 12 11	4 47 9 1	5 28 9 0	8.2					
Th.	2	1 8 29 6	1 53 29 10	5 22 13 0	6 4 13 3	6 11 9 1	6 51 9 3	9.2						
F.	3	2 37 30 7	3 19 31 8	6 42 13 7	7 17 14 0	7 29 9 6	8 6 9 9	10.2						
S.	4	3 58 32 11	4 33 34 4	7 48 14 7	8 15 15 1	8 39 10 0	9 9 10 4	11.2						
Sa.	5	5 4 35 6	5 31 36 8	8 39 15 6	9 0 15 11	9 37 10 7	9 59 10 10	12.2						
Mo.	6	5 58 37 8	6 23 38 4	9 22 16 4	9 44 16 7	10 21 11 1	10 41 11 3	13.2						
Tu.	7	6 45 38 10	7 7 39 2	10 4 16 9	10 24 16 11	11 1 11 5	11 21 11 6	0						
W.	8	7 28 39 3	7 48 39 1	10 42 16 10	11 0 16 9	11 40 11 5	—	15.2						
Th.	9	8 7 38 9	8 25 38 3	11 18 16 7	11 37 16 4	0 1 11 4	0 21 11 3	16.2						
F.	10	8 42 37 8	8 59 36 10	11 57 16 0	—	0 40 11 1	1 0 10 10	17.2						
S.	11	9 15 35 11	9 32 34 10	0 17 15 7	0 37 15 2	1 20 10 7	1 39 10 4	18.2						
Sa.	12	9 48 33 8	10 4 32 6	0 57 14 9	1 19 14 2	1 58 10 1	2 19 9 10	19.2						
Mo.	13	10 21 31 3	10 39 30 0	1 41 13 9	2 4 13 3	2 40 9 6	3 3 9 3	20.2						
Tu.	14	11 1 28 11	11 27 27 11	2 29 12 9	2 58 12 5	3 28 9 0	3 57 8 9	21.2						
W.	15	12 0 27 3	—	3 30 12 1	4 8 11 11	4 28 8 7	5 4 8 5	22.2						
Th.	16	0 37 26 10	1 17 26 10	4 49 11 10	5 30 11 11	5 41 8 5	6 17 8 6	23.2						
F.	17	1 55 27 3	2 33 27 9	6 10 12 2	6 39 12 5	6 52 8 8	7 26 8 10	24.2						
S.	18	3 9 28 7	3 42 29 7	7 10 12 9	7 36 13 2	7 58 9 0	8 26 9 3	25.2						
Sa.	19	4 14 30 8	4 40 31 10	8 0 13 7	8 22 14 0	8 53 9 6	9 16 9 9	26.2						
Mo.	20	5 4 32 11	5 26 34 1	8 40 14 5	8 56 14 10	9 38 10 0	9 56 10 3	27.2						
Tu.	21	5 46 35 0	6 6 35 10	9 12 15 3	9 29 15 6	10 12 10 5	10 28 10 8	28.2						
W.	22	6 26 36 6	6 45 37 0	9 46 15 10	10 4 16 0	10 44 10 10	11 1 11 0	29.2						
Th.	23	7 4 37 7	7 24 38 0	10 21 16 3	10 38 16 4	11 18 11 1	11 36 11 1	30.2						
F.	24	7 43 38 2	8 1 38 1	10 55 16 4	11 12 16 3	11 55 11 1	—	1.7						
S.	25	8 20 37 11	8 39 37 8	11 32 16 2	11 54 16 0	0 15 11 1	0 36 11 0	2.7						
Sa.	26	8 58 37 3	9 18 36 8	—	0 16 15 9	0 58 10 10	1 19 10 8	3.7						
Mo.	27	9 38 35 10	9 58 34 9	0 40 15 6	1 5 15 1	1 41 10 6	2 5 10 3	4.7						
Tu.	28	10 19 33 9	10 42 32 8	1 31 14 8	1 59 14 3	2 31 10 1	2 58 9 10	5.7						
W.	29	11 9 31 7	11 42 30 9	2 30 13 11	3 5 13 6	3 28 9 8	4 4 9 5	6.7						
Th.	30	—	0 19 30 3	3 46 13 3	4 29 13 2	4 44 9 3	5 24 9 2	7.7						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.	
1	3	49	Sub.	9	1	29	Sub.	17	0	34	Add.	25	2	11	Add.
2	3	31		10	1	12		18	0	48		26	2	21	
3	3	13		11	0	56		19	1	1		27	2	31	
4	2	55		12	0	40		20	1	14		28	2	40	
5	2	37		13	0	24		21	1	26		29	2	49	
6	2	20		14	0	9		22	1	38		30	2	57	
7	2	2		15	0	6	Add.	23	1	50					
8	1	45		16	0	20		24	2	1					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12m. ! HOLYHEAD add 18 m. ! KINGSTOWN subtract 1 m. for Dublin Time.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.						
W.	1	7 22	4 28	8 4	5 9	8 3	1 58	5 9	2 46	5 9	11 42	8 7	—	—												
Th.	2	8 19	5 51	8 2	6 34	8 2	3 30	6 0	4 8	6 3	0 26	8 7	1 8	8												
F.	3	9 14	7 15	8 3	7 51	8 6	4 41	6 6	5 9	6 9	1 48	9 0	2 24	9												
S.	4	10 8	8 22	8 9	8 48	9 0	5 34	7 0	5 59	7 3	2 53	9 10	3 19	10												
S.	5	11 1	9 13	9 3	9 36	9 5	6 23	7 6	6 46	7 9	3 41	10 8	4 21	11												
M.	6	11 52	9 58	9 7	10 20	9 8	7 10	7 11	7 33	8 0	4 24	11 4	4 47	11												
Tu.	7	morn	10 40	9 9	11 0	9 9	7 54	8 2	8 13	8 3	5 8	11 10	5 30	11												
W.	8	0 43	11 19	9 9	11 38	9 8	8 32	8 3	8 50	8 1	5 49	11 11	6 8	11												
Th.	9	1 33	11 57	9 8	—	—	9 8	7 11	9 25	7 9	6 26	11 7	6 46	11												
F.	10	2 23	0 16	9 7	0 36	9 5	9 43	7 6	10 0	7 3	7 5	11 1	7 24	10												
S.	11	3 13	0 56	9 4	1 15	9 2	10 18	7 1	10 37	6 10	7 42	10 3	8 0	9												
S.	12	4 3	1 36	9 0	1 59	8 10	10 58	6 6	11 23	6 2	8 20	9 6	8 42	9												
M.	13	4 52	2 22	8 8	2 46	8 5	11 52	5 10	—	—	9 6	8 8	9 34	8												
Tu.	14	5 40	3 11	8 3	3 39	8 1	0 24	5 6	1 0	5 4	10 6	8 1	10 40	7												
W.	15	6 28	4 10	7 11	4 45	7 10	1 38	5 3	2 20	5 2	11 17	7 10	11 56	7												
Th.	16	7 14	5 23	7 9	6 0	7 9	3 0	5 3	3 37	5 6	—	—	0 34	7												
F.	17	7 59	6 36	7 9	7 12	7 10	4 9	5 8	4 38	5 10	1 10	8 0	1 45	8												
S.	18	8 44	7 44	8 0	8 11	8 2	5 4	6 1	5 26	6 3	2 17	8 5	2 43	8												
S.	19	9 29	8 35	8 5	8 55	8 8	5 47	6 6	6 6	6 8	3 6	9 2	3 26	9												
M.	20	10 14	9 14	8 10	9 31	9 0	6 24	6 11	6 42	7 1	3 42	9 10	3 58	10												
Tu.	21	11 0	9 48	9 2	10 5	9 4	7 0	7 3	7 18	7 5	4 14	10 6	4 31	10												
W.	22	11 47	10 22	9 5	10 40	9 6	7 36	7 7	7 54	7 9	4 49	11 0	5 8	11												
Th.	23	0 37	10 57	9 7	11 15	9 7	8 11	7 10	8 28	7 11	5 27	11 5	5 45	11												
F.	24	1 30	11 33	9 7	11 51	9 6	8 45	7 11	9 3	7 10	6 3	11 6	6 21	11												
S.	25	2 24	—	—	0 11	9 6	9 21	7 9	9 40	7 7	6 41	11 3	7 21	11												
S.	26	3 21	0 33	9 5	0 55	9 4	9 59	7 5	10 20	7 3	7 23	10 9	7 44	10												
M.	27	4 19	1 18	9 3	1 44	9 2	10 43	7 1	11 10	6 9	8 7	10 2	8 32	9												
Tu.	28	5 17	2 12	9 0	2 41	8 10	11 44	6 5	—	—	9 0	9 6	9 35	9												
W.	29	6 14	3 12	8 8	3 47	8 6	0 24	6 1	1 7	5 11	10 13	8 11	10 55	8												
Th.	30	7 9	4 25	8 5	5 5	8 4	1 55	5 11	2 41	6 0	11 37	8 9	—	—												

Half Mean Spring } 4 ft. 9 in.
Range.

3ft. 10in.

5^{ft.} 7^{in.}

Phases of the Moon.

	D.	H.	M.	
Full - - - -	7	7	17	Morning.
Last Quarter -	14	10	34	Afternoon.
New - - - -	22	8	20	Afternoon.
First Quarter	29	6	18	Afternoon.
<hr/>				
In Perigee- -	3	4	0	Afternoon.
In Apogee- -	15	4	0	Afternoon.
In Perigee- -	29	3	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	N. 54	9	128.	22	17	128.	20	25	16	N.
2	15	49	10	15	18	18	9	3	26	18	
3	12	44	11	17	24	19	5	21	27	19	
4	8	53	12	18	38	20	1	20	28	18	
5	4	32	13	18	58	21	2	N. 51	29	16	
6	08.	3	14	18	27	22	6	59	30	13	
7	4	33	15	17	7	23	10	53			
8	8	44	16	15	3	24	14	16			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
BELFAST subtract 2 m. **LONDONDERRY** add 4 m. **SLIGO BAY** add 1 m.

BRITISH AND IRISH PORTS.

APRIL, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.			
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.	
	1	10 50	11 2	11 37	11 3	10 48	9 4	11 34	9 4	11 10	10 2	11 52	10
	2	—	—	0 20	11 6	—	—	0 18	9 6	—	—	0 32	10
	3	1 0	11 11	1 35	12 5	1 1	9 9	1 43	10 1	1 12	10 0	1 51	10
	4	2 5	13 0	2 33	13 7	2 18	10 5	2 48	10 10	2 29	11 3	3 3	11
	5	2 59	14 0	3 22	14 6	3 17	11 2	3 42	11 7	3 33	12 0	4 0	12
	6	3 44	14 11	4 6	15 3	4 7	11 10	4 30	12 1	4 27	12 7	4 52	12
	7	4 27	15 7	4 47	15 9	4 52	12 3	5 13	12 5	5 14	12 11	5 35	13
	8	5 7	15 9	5 28	15 8	5 34	12 5	5 55	12 4	5 55	13 0	6 15	13
	9	5 48	15 6	6 7	15 2	6 15	12 2	6 34	12 1	6 35	12 11	6 54	12
	10	6 26	14 10	6 45	14 5	6 52	11 10	7 10	11 6	7 13	12 7	7 31	12
	11	7 4	13 11	7 23	13 5	7 28	11 2	7 47	10 10	7 48	12 1	8 6	11
	12	7 44	13 0	8 6	12 4	8 5	10 6	8 23	10 2	8 23	11 6	8 41	11
	13	8 28	11 8	8 52	11 1	8 42	9 9	9 3	9 5	8 59	10 9	9 18	10
	14	9 18	10 8	9 49	10 3	9 26	9 1	9 52	8 10	9 43	10 1	10 12	9
	15	10 25	10 0	10 4	10 0	10 24	8 8	11 3	11 6	10 46	9 6	11 23	9
	16	11 46	10 1	—	—	11 43	8 6	—	—	11 59	9 1	—	—
	17	0 22	10 3	0 57	10 7	0 20	8 8	0 57	8 10	0 34	9 5	1 8	9
	18	1 28	11 0	1 54	11 5	1 33	9 1	2 4	9 5	1 41	9 10	2 13	10
	19	2 18	12 0	2 40	12 5	2 33	9 9	2 56	10 1	2 44	10 7	3 10	10
	20	3 0	12 10	3 18	13 4	3 17	10 5	3 37	10 9	3 34	11 2	3 55	11
	21	3 34	13 9	3 51	14 1	3 56	11 0	4 14	11 4	4 16	11 10	4 36	12
	22	4 9	14 5	4 27	14 9	4 32	11 6	4 51	11 9	4 55	12 2	5 14	12
	23	4 44	15 0	5 3	15 2	5 10	11 11	5 30	12 0	5 32	12 6	5 51	12
	24	5 23	15 3	5 42	15 2	5 50	12 0	6 9	12 0	6 10	12 8	6 29	12
	25	6 2	15 1	6 23	14 10	6 28	11 11	6 48	11 10	6 49	12 8	7 10	12
	26	6 44	14 7	7 6	14 3	7 9	11 8	7 30	11 5	7 30	12 6	7 51	12
	27	7 30	13 11	7 56	13 5	7 52	11 2	8 15	10 10	8 12	12 1	8 33	11
	28	8 24	12 10	8 54	12 11	8 39	10 6	9 6	10 3	8 56	11 6	9 20	11
	29	9 26	11 10	10 4	11 7	9 34	9 11	10 6	9 8	9 50	10 11	10 27	10
	30	10 45	11 6	11 27	11 7	10 44	9 7	11 24	9 7	11 6	10 5	11 43	10
Half Mean Spring } Range.		7 ft. 5 in.				5 ft. 10 in.				6 ft. 2 in.			

Equation of Time at Noon.

D.	M.	A.		M.D.	M.	A.		M.D.	M.	A.		M.D.	M.	A.
	3	49	Sub.	9	1	29	Sub.	17	0	34	Add.	25	2	11
	3	31		10	1	12		18	0	48		26	2	21
	3	13		11	0	56		19	1	1		27	2	31
	2	55		12	0	40		20	1	14		28	2	40
	2	37		13	0	24		21	1	26		29	2	49
	2	20		14	0	9		22	1	38		30	2	57
	2	2		15	0	6	Add.	23	1	50				
	1	45		16	0	20		24	2	1				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

MAY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		H. M.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	8 ²	11 5	14 11	11 45	15 3	—	—	0 33	12 7	6 13	10 6	6 54	10 7
S.	2	8 54	—	—	0 20	15 9	1 17	13 5	1 56	13 1	7 32	10 10	8 8	11 2
S.	3	9 44	0 49	16 4	1 20	17 0	2 33	14 0	3 5	13 11	8 40	11 6	9 12	11 10
M.	4	10 34	1 46	17 8	2 10	18 3	3 33	14 10	4 1	14 9	9 40	12 2	10 5	12 4
Tu.	5	11 24	2 32	18 8	2 53	19 1	4 26	15 5	4 50	15 4	10 28	12 6	10 50	12 8
W.	6	morn.	3 14	19 4	3 35	19 5	5 12	15 9	5 32	15 8	11 11	12 9	11 31	12 10
Th.	7	0 13	3 56	19 4	4 15	19 3	5 52	15 9	6 11	15 9	11 51	12 10	—	—
F.	8	1 3	4 33	19 0	4 51	18 9	6 30	15 8	6 48	15 6	0 11	12 9	0 31	12 7
S.	9	1 53	5 9	18 4	5 25	18 0	7 3	15 2	7 19	15 0	0 50	12 5	1 8	12 3
S.	10	2 43	5 43	17 7	6 2	17 1	7 35	14 7	7 51	14 6	1 27	12 1	1 45	11 10
M.	11	3 33	6 22	16 7	6 42	15 11	8 7	13 10	8 24	13 10	2 4	11 8	2 23	11 9
Tu.	12	4 21	7 4	15 4	7 26	14 9	8 41	12 11	9 0	13 1	2 43	11 2	3 4	10 11
W.	13	5 8	7 48	14 2	8 13	13 8	9 20	12 2	9 43	12 5	3 25	10 8	3 46	10 9
Th.	14	5 53	8 41	13 5	9 13	13 2	10 7	11 6	10 34	11 11	4 10	10 2	4 37	10 0
F.	15	6 38	9 47	13 2	10 24	13 3	11 5	11 2	11 42	11 10	5 7	9 10	5 40	9 9
S.	16	7 22	11 0	13 6	11 34	13 10	—	—	0 21	11 5	6 15	9 9	6 49	9 10
S.	17	8 6	—	—	0 6	14 3	1 0	12 3	1 37	12 1	7 22	10 1	7 5	—
M.	18	8 51	0 34	14 10	1 1	15 5	2 12	13 0	2 41	13 0	8 24	10 8	8 5	—
Tu.	19	9 38	1 26	16 1	1 46	16 9	3 9	13 11	3 34	14 0	9 18	11 4	9 4	—
W.	20	10 27	2 6	17 4	2 27	17 11	3 58	14 7	4 21	14 8	10 1	11 11	10 2	—
Th.	21	11 18	2 48	18 6	3 9	19 0	4 44	15 1	5 5	15 3	10 43	12 5	11	—
F.	22	0 13	3 29	19 3	3 50	19 5	5 26	15 7	5 47	15 8	11 25	12 9	11 4	—
S.	23	1 11	4 11	19 7	4 32	19 7	6 8	15 9	6 29	15 11	—	—	0	—
S.	24	2 10	4 53	19 6	5 15	19 4	6 50	15 10	7 11	15 11	0 30	12 10	0 5	—
M.	25	3 10	5 37	19 1	6 2	18 9	7 32	15 6	7 54	15 8	1 15	12 9	1 3	—
Tu.	26	4 9	6 28	18 4	6 54	17 8	8 16	15 0	8 40	15 3	2 2	12 6	2 2	—
W.	27	5 6	7 22	17 1	7 52	16 6	9 5	14 4	9 32	14 7	2 54	12 1	3 1	—
Th.	28	6 0	8 22	15 11	8 54	15 6	10 0	13 6	10 29	13 10	3 50	11 7	4 1	—
F.	29	6 52	9 27	15 3	10 4	15 2	11 1	12 11	11 35	13 4	4 50	11 0	5 2	—
S.	30	7 42	10 41	15 2	11 17	15 4	—	—	0 14	12 8	5 56	10 9	6 3	—
S.	31	8 30	11 52	15 7	—	—	0 53	13 4	1 31	13 2	7 5	10 10	7 4	—

Half Mean Spring }
Range. } 9^{ft.} 6^{in.}7^{ft.} 9^{in.}6^{ft.} 4^{in.}

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	6	6	37	Afternoon.
Last Quarter -	14	5	15	Afternoon.
New - - - - -	22	6	36	Morning.
First Quarter -	28	11	42	Afternoon.
In Apogee - -	13	11	0	Morning.
In Perigee - -	25	9	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	10	N. 8	9	18	S. 28	17	28	59	25	18	N. 55
2	5	57	10	19	9	18	1	N. 10	26	17	22
3	1	29	11	18	56	19	5	22	27	14	43
4	3	1	12	17	53	20	9	26	28	11	14
5	7	18	13	16	3	21	13	7	29	7	9
6	11	10	14	13	32	22	16	9	30	2	44
7	14	24	15	10	27	23	18	16	31	1	S. 44
8	16	52	16	6	54	24	19	13			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

MAY, 1868.

Week Day.	Month Day.	DOVER.				SHEERNESS.				LONDON.				C's Age at Noon.
		Morning.		Afternoon.		Morning.		Afternoon.		Morning.		Afternoon.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.	
	1	5 44 15 2	6 20 15 4	7 20 13 6	8 4 13 8	8 47 16 6	9 29 16 6	8.7						
	2	6 58 15 9	7 34 16 2	8 45 13 10	9 23 14 2	10 10 16 7	10 49 16 9	9.7						
	3	8 5 16 9	8 35 17 11	9 57 14 6	10 25 14 11	11 25 17 0	11 56 17 5	10.7						
	4	9 3 17 8	9 28 18 0	10 53 15 3	11 19 15 7	— — — —	0 24 17 9	11.7						
	5	9 52 18 4	10 16 18 8	11 43 15 10	— — — —	0 49 18 2	1 13 18 6	12.7						
	6	10 39 18 10	11 2 18 11	0 5 16 0	0 26 16 2	1 36 18 9	1 58 19 0	0						
	7	11 24 18 11	11 44 18 10	0 47 16 3	1 8 16 4	2 18 19 2	2 38 19 3	14.7						
	8	— — — —	0 5 18 8	1 28 16 4	1 47 16 3	2 57 19 4	3 14 19 3	15.7						
	9	0 25 18 5	0 44 18 2	2 4 16 1	2 22 15 10	3 32 19 2	3 50 19 0	16.7						
	0	1 4 17 11	1 24 17 7	2 39 15 8	2 56 15 5	4 9 18 9	4 27 18 7	17.7						
	1	1 43 17 3	2 3 16 11	3 14 15 2	3 32 14 10	4 46 18 3	5 4 18 0	18.7						
	2	2 24 16 5	2 45 16 0	3 52 14 7	4 12 14 2	5 22 17 8	5 41 17 4	19.7						
	3	3 6 15 7	3 28 15 2	4 34 13 10	4 56 13 7	6 3 17 0	6 26 16 8	20.7						
	4	3 51 14 9	4 16 14 5	5 20 13 3	5 47 13 0	6 50 16 4	7 15 16 0	21.7						
	5	4 44 14 1	5 14 14 0	6 18 12 10	6 52 12 8	7 44 15 10	8 18 15 8	22.7						
	6	5 45 14 0	6 16 14 2	7 28 12 8	8 6 12 10	8 55 15 7	9 31 15 7	23.7						
	7	6 48 14 6	7 20 15 0	8 41 13 0	9 13 13 4	10 5 15 8	10 38 15 11	24.7						
	8	7 49 15 5	8 16 15 11	9 43 13 8	10 11 14 0	11 10 16 1	11 39 16 5	25.7						
	9	8 41 16 5	9 3 16 11	10 36 14 4	11 0 14 8	— — — —	0 6 16 9	26.7						
	10	9 25 17 4	9 47 17 9	11 20 15 0	11 40 15 4	0 28 17 2	0 49 17 7	27.7						
	11	10 10 18 2	10 33 18 6	12 0 15 7	— — — —	1 11 17 11	1 32 18 3	28.7						
	12	10 55 18 9	11 19 18 11	0 20 15 11	0 41 16 1	1 51 18 8	2 11 18 11	29.7						
	13	11 41 19 0	— — — —	1 2 16 3	1 22 16 5	2 31 19 2	2 52 19 4	30.7						
	14	0 4 19 1	0 28 19 1	1 43 16 5	2 4 16 5	3 13 19 6	3 34 19 6	31.7						
	15	0 52 19 0	1 16 18 10	2 25 16 4	2 46 16 3	3 54 19 6	4 17 19 5	32.7						
	16	1 42 18 7	2 9 18 4	3 7 16 1	3 31 15 10	4 40 19 3	5 3 19 0	33.7						
	17	2 36 17 11	3 3 17 5	3 57 15 6	4 24 15 2	5 27 18 9	5 53 18 5	34.7						
	18	3 31 17 0	4 0 16 6	4 52 14 10	5 22 14 6	6 20 18 1	6 50 17 8	35.7						
	19	4 29 16 1	4 58 15 9	5 55 14 3	6 30 14 0	7 22 17 4	7 58 17 1	36.7						
	20	5 29 15 7	6 0 15 6	7 6 13 10	7 45 13 10	8 36 16 11	9 13 16 10	37.7						
	21	6 32 15 9	7 6 16 0	8 22 13 11	8 57 14 2	9 46 16 9	10 19 16 10	38.7						
Half Mean Spring Range.		9 ft. 4 in.				8 ft. 0 in.				9 ft. 7 in.				

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	3 4		9	3 46		17	3 50		25	3 17	
2	3 11		10	3 48		18	3 48		26	3 11	
3	3 18		11	3 50		19	3 45		27	3 4	
4	3 24		12	3 51		20	3 42		28	2 57	
5	3 29		13	3 52		21	3 38		29	2 49	
6	3 34		14	3 52		22	3 33		30	2 41	
7	3 39		15	3 52		23	3 29		31	2 33	
8	3 42		16	3 51		24	3 23				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

MAY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.																														
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																										
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																															
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
F.	1	8a 2	6 26	10 0	7 12	10 1	1 4	17 1	1 41	17 1	10 32	11 7	11 11	11 9																																			
S.	2	8 54	7 53	10 3	8 30	10 5	2 18	17 5	2 52	17 11	11 45	12 1	—	—																																			
S.	3	9 44	9 4	10 8	9 33	10 11	3 24	18 6	3 54	19 1	0 15	12 5	0 44	12 10																																			
M.	4	10 34	10 3	11 1	10 30	11 4	4 23	19 8	4 48	20 2	1 13	13 3	1 41	13 7																																			
Tu.	5	11 24	10 54	11 6	11 17	11 8	5 11	20 6	5 33	20 9	2 6	13 10	2 29	14 1																																			
W.	6	morn.	11 39	11 9	—	—	5 55	20 11	6 17	21 1	2 51	14 3	3 11	14 5																																			
Th.	7	0 13	0 1	11 9	0 21	11 9	6 39	21 2	7 0	21 1	3 31	14 6	3 51	14 7																																			
F.	8	1 3	0 40	11 9	0 59	11 8	7 19	21 0	7 38	20 10	4 9	14 6	4 27	14 5																																			
S.	9	1 53	1 18	11 6	1 36	11 4	7 55	20 7	8 12	20 3	4 45	14 2	5 2	13 11																																			
S.	10	2 43	1 54	11 2	2 13	11 0	8 30	20 0	8 49	19 6	5 20	13 7	5 39	13 3																																			
M.	11	3 33	2 32	10 10	2 51	10 7	9 8	19 0	9 28	18 6	5 59	12 11	6 19	12 6																																			
Tu.	12	4 21	3 10	10 5	3 30	10 3	9 48	18 0	10 10	17 6	6 42	12 2	7 5	11 10																																			
W.	13	5 8	3 50	10 0	4 11	9 10	10 22	17 1	10 59	16 8	7 28	11 6	7 52	11 3																																			
Th.	14	5 53	4 33	9 9	4 59	9 7	11 29	16 3	—	—	8 19	10 11	8 50	10 9																																			
F.	15	6 38	5 27	9 6	5 59	9 5	0 3	16 0	0 37	15 9	9 23	10 8	9 59	10 7																																			
S.	16	7 22	6 35	9 5	7 14	9 6	1 10	15 9	1 42	15 10	10 34	10 8	11 7	10 10																																			
S.	17	8 6	7 49	9 8	8 21	9 10	2 13	16 2	2 43	16 7	11 37	11 1	—	—																																			
M.	18	8 51	8 50	10 1	9 18	10 3	3 12	17 2	3 39	17 9	0 6	11 5	0 30	11 10																																			
Tu.	19	9 38	9 44	10 6	10 9	10 9	4 5	18 3	4 29	18 10	0 54	12 3	1 18	12 8																																			
W.	20	10 27	10 31	11 0	10 51	11 2	4 49	19 3	5 8	19 9	1 41	13 0	2 3	13 4																																			
Th.	21	11 18	11 12	11 5	11 33	11 7	5 28	20 2	5 50	20 6	2 24	13 8	2 45	13 11																																			
F.	22	0a 13	11 54	11 8	—	—	6 12	20 9	6 33	21 0	3 5	14 2	3 25	14 5																																			
S.	23	1 11	0 15	11 9	0 35	11 9	6 54	21 2	7 15	21 3	3 45	14 7	4 5	14 9																																			
S.	24	2 10	0 56	11 9	1 18	11 9	7 37	21 4	7 58	21 3	4 26	14 9	4 47	14 8																																			
M.	25	3 10	1 39	11 8	2 1	11 6	8 19	21 2	8 42	20 11	5 9	14 6	5 32	14 3																																			
Tu.	26	4 9	2 24	11 5	2 49	11 3	9 7	20 6	9 33	20 1	5 58	14 0	6 26	13 8																																			
W.	27	5 6	3 15	11 1	3 41	10 11	9 59	19 6	10 28	19 0	6 55	13 3	7 24	12 11																																			
Th.	28	6 0	4 8	10 8	4 36	10 6	10 59	18 7	11 36	18 2	7 54	12 7	8 27	12 4																																			
F.	29	6 52	5 8	10 4	5 40	10 3	—	—	0 15	17 10	9 2	12 1	9 38	11 11																																			
S.	30	7 42	6 13	10 2	6 52	10 3	0 50	17 7	1 24	17 6	10 15	11 10	10 49	11 11																																			
S.	31	8 30	7 30	10 4	8 4	10 5	1 57	17 7	2 28	17 10	11 21	12 1	11 51	12 3																																			
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.																														
Phases of the Moon.																									Moon's Declination at Noon.																								
D. H. M.																									M.D. ° ' "																								
Full - - - 6 6 37 Afternoon.																									1 10 N. 8 9 18 S. 28 17 2 S. 59 25 18 N. 55																								
Last Quarter - 14 5 15 Afternoon.																									2 5 57 10 19 9 18 1 N. 10 26 17 22																								
New - - - 22 6 36 Morning.																									3 1 29 11 18 56 19 5 22 27 14 43																								
First Quarter - 28 11 42 Afternoon.																									4 3 S. 1 12 17 53 20 9 26 28 11 14																								
																									5 7 18 13 16 3 21 13 7 29 7 9																								
In Apogee - 13 11 0 Morning.																									6 11 10 14 13 32 22 16 9 30 2 44																								
In Perigee - 25 9 0 Morning.																									7 14 24 15 10 27 23 18 16 31 1 S. 44																								
																									8 16 52 16 6 54 24 19 13																								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

MAY, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.						LEITH.						THURSO.						C's AGE AT NOON.
		MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.			D.
F.	1	10 44	10 6	11 23	10 9		9 39	13 3		10 17	13 5		3 35	10 1		4 16	10 2		8.7	
S.	2	11 59	11 1	—	—		10 52	13 8		11 23	14 0		4 53	10 5		5 25	10 8		9.7	
S.	3	0 30	11 4	0 56	11 8		11 50	14 5	—	—		5 52	11 2		6 18	11 8		10.7		
M.	4	1 22	12 0	1 47	12 4		0 16	14 10	0 41	15 4		6 41	12 2		7 1	12 7		11.7		
Tu.	5	2 10	12 8	2 32	12 11		1 5	15 8	1 28	16 0		7 20	12 11		7 39	13 3		12.7		
W.	6	2 52	13 2	3 12	13 4		1 49	16 4	2 10	16 6		7 58	13 6		8 18	13 7		13.7		
Th.	7	3 32	13 5	3 52	13 5		2 30	16 7	2 49	16 7		8 37	13 6		8 55	13 4		14.7		
F.	8	4 11	13 4	4 29	13 2		3 6	16 5	3 24	16 2		9 13	13 2		9 32	12 11		15.7		
S.	9	4 48	12 11	5 6	12 7		3 42	15 11	4 0	15 7		9 50	12 7		10 9	12 4		16.7		
S.	10	5 24	12 4	5 43	12 0		4 19	15 4	4 38	15 0		10 28	11 11		10 48	11 6		17.7		
M.	11	6 3	11 9	6 23	11 6		4 57	14 8	5 17	14 4		11 9	11 2		11 32	10 9		18.7		
Tu.	12	6 44	11 1	7 7	10 10		5 40	13 11	6 3	13 6		11 55	10 4		—	—		19.7		
W.	13	7 31	10 5	7 57	10 1		6 27	13 2	6 51	12 10		0 19	10 0		0 44	9 8		20.7		
Th.	14	8 26	9 9	8 59	9 7		7 21	12 6	7 53	12 3		1 11	9 5		1 44	9 3		21.7		
F.	15	9 35	9 6	10 11	9 6		8 27	12 2	9 4	12 1		2 19	9 1		2 57	9 1		22.7		
S.	16	10 46	9 8	11 19	9 10		9 40	12 3	10 13	12 5		3 37	9 1		4 12	9 3		23.7		
S.	17	11 50	10 2	—	—		10 43	12 8	11 11	13 0		4 44	9 5		5 13	9 8		24.7		
M.	18	0 18	10 5	0 43	10 9		11 37	13 4	—	—		5 39	10 0		6 2	10 6		25.7		
Tu.	19	1 7	11 1	1 29	11 5		0 1	13 9	0 23	14 2		6 24	11 0		6 41	11 6		26.7		
W.	20	1 48	11 9	2 7	12 2		0 42	14 8	1 2	15 1		6 58	11 11		7 15	12 5		27.7		
Th.	21	2 27	12 6	2 46	12 10		1 23	15 6	1 43	15 11		7 33	12 10		7 52	13 3		28.7		
F.	22	3 6	13 1	3 26	13 4		2 4	16 3	2 24	16 6		8 12	13 6		8 31	13 7		29.7		
S.	23	3 46	13 6	4 6	13 7		2 43	16 7	3 2	16 8		8 51	13 7		9 12	13 7		30.7		
S.	24	4 28	13 6	4 50	13 4		3 23	16 7	3 45	16 5		9 34	13 5		9 57	13 3		31.7		
M.	25	5 13	13 2	5 36	13 0		4 7	16 3	4 31	16 1		10 21	13 0		10 47	12 9		32.7		
Tu.	26	6 2	12 10	6 29	12 7		4 56	15 10	5 23	15 6		11 15	12 4		11 44	12 0		33.7		
W.	27	6 56	12 3	7 25	11 11		5 52	15 2	6 22	14 9		—	—		0 13	11 7		34.7		
Th.	28	7 58	11 6	8 33	11 1		6 53	14 4	7 28	14 0		0 45	11 3		1 19	10 11		35.7		
F.	29	9 11	10 10	9 49	10 9		8 4	13 9	8 41	13 7		1 55	10 8		2 33	10 6		36.7		
S.	30	10 26	10 9	11 1	10 11		9 21	13 6	9 56	13 7		3 14	10 5		3 53	10 5		37.7		
S.	31	11 34	11 1	—	—		10 28	13 9	10 58	13 11		4 27	10 6		5 0	10 7		38.7		
Half Mean Spring Range.		6ft. 8in.						8ft. 2in.						6ft. 7in.						

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	3	4	Add.	9	3	46	Add.	17	3	50	Add.	25	3	17	Add.
2	3	11		10	3	48		18	3	48		26	3	11	
3	3	18		11	3	50		19	3	45		27	3	4	
4	3	24		12	3	51		20	3	42		28	2	57	
5	3	29		13	3	52		21	3	38		29	2	49	
6	3	34		14	3	52		22	3	33		30	2	41	
7	3	39		15	3	52		23	3	29		31	2	33	
8	3	42		16	3	51		24	3	23					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—for
 NORTH SHIELDS add 6 m. LEITH add 18 m. THURSO add 14 m.

MAY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	8a 2	6 39	8 6	7 19	8 6	6 5	21 1	6 48	21 5	0 21	16 5	1 2	16 5
S.	2	8 54	7 57	8 8	8 32	8 10	7 26	22 0	8 0	22 8	1 45	17 0	2 23	17 0
S.	3	9 44	9 2	9 0	9 33	9 2	8 28	23 4	8 56	24 1	2 56	18 2	3 29	18 1
M.	4	10 34	10 1	9 4	10 25	9 6	9 21	24 8	9 45	25 3	4 0	19 6	4 27	20 0
Tu.	5	11 24	10 49	9 7	11 13	9 8	10 6	25 7	10 27	25 11	4 52	20 6	5 17	20 1
W.	6	morn.	11 36	9 8	11 59	9 9	10 49	26 1	11 11	26 3	5 41	21 1	6 3	21 1
Th.	7	0 13	—	—	0 20	9 9	11 31	26 3	11 50	26 2	6 22	21 3	6 41	21 1
F.	8	1 3	0 39	9 9	0 58	9 9	—	—	0 9	25 11	6 59	20 11	7 17	20 0
S.	9	1 53	1 17	9 8	1 35	9 7	0 27	25 8	0 45	25 3	7 35	20 3	7 53	19 1
S.	10	2 43	1 52	9 6	2 10	9 4	1 2	24 10	1 20	24 2	8 12	19 5	8 30	19 0
M.	11	3 33	2 28	9 3	2 47	9 1	1 38	23 7	1 58	23 0	8 49	18 6	9 9	17 1
Tu.	12	4 21	3 7	8 11	3 27	8 10	2 18	22 4	2 38	21 9	9 29	17 4	9 48	16 1
W.	13	5 8	3 48	8 8	4 10	8 6	2 59	21 3	3 21	20 7	10 8	16 4	10 29	15 1
Th.	14	5 53	4 34	8 5	5 2	8 3	3 47	20 1	4 18	19 8	10 53	15 5	11 20	15 0
F.	15	6 38	5 33	8 2	6 6	8 1	4 51	19 4	5 28	19 4	11 50	14 11	—	—
S.	16	7 22	6 41	8 0	7 15	8 1	6 7	19 6	6 44	19 10	0 22	15 0	0 57	15 0
S.	17	8 6	7 47	8 3	8 18	8 4	7 17	20 4	7 47	20 11	1 34	15 6	2 9	16 0
M.	18	8 51	8 46	8 6	9 13	8 9	8 15	21 7	8 39	22 3	2 39	16 7	3 8	17 0
Tu.	19	9 38	9 39	8 11	10 1	9 1	9 2	23 0	9 22	23 7	3 36	18 0	4 0	18 0
W.	20	10 27	10 22	9 2	10 44	9 4	9 41	24 3	10 1	24 10	4 23	19 2	4 47	19 1
Th.	21	11 18	11 7	9 6	11 30	9 7	10 22	25 4	10 44	25 9	5 11	20 4	5 34	20 0
F.	22	0a 13	11 52	9 8	—	—	11 4	26 1	11 25	26 4	5 56	21 0	6 16	21 0
S.	23	1 11	0 14	9 9	0 35	9 10	11 46	26 6	—	—	6 37	21 6	6 58	21 0
S.	24	2 10	0 57	9 11	1 20	9 11	0 8	26 7	0 30	26 6	7 20	21 5	7 42	21 0
M.	25	3 10	1 42	9 11	2 4	9 10	0 52	26 4	1 14	26 0	8 5	21 0	8 29	20 0
Tu.	26	4 9	2 28	9 9	2 53	9 7	1 38	25 6	2 3	25 0	8 55	20 3	9 20	19 0
W.	27	5 6	3 18	9 6	3 45	9 4	2 29	24 4	2 57	23 9	9 45	19 1	10 12	18 0
Th.	28	6 0	4 14	9 3	4 44	9 1	3 25	23 2	3 56	22 6	10 39	18 1	11 6	17 0
F.	29	6 52	5 15	8 11	5 47	8 9	4 30	22 0	5 6	21 8	11 34	17 1	—	—
S.	30	7 42	6 22	8 8	6 56	8 7	5 45	21 7	6 25	21 9	0 5	16 11	0 38	16 0
S.	31	8 30	7 30	8 8	8 4	8 9	7 0	22 0	7 33	22 5	1 15	17 0	1 54	17 0
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			

Phases of the Moon.				Moon's Declination at Noon.			
	D.	H.	M.	M.D.	°	'	
Full	6	6	37 Afternoon.	1	10	N. 8	
Last Quarter	14	5	15 Afternoon.	2	5	57	
New	22	6	36 Morning.	3	1	29	
First Quarter	28	11	42 Afternoon.	4	3	8. 1	
				5	7	18	
In Apogee	13	11	0 Morning.	6	11	10	
In Perigee	25	9	0 Morning.	7	14	24	
				8	16	52	
				M.D.	°	'	
				9	18	S. 28	
				10	19	9	
				11	18	56	
				12	17	53	
				13	16	3	
				14	13	32	
				15	10	27	
				16	6	54	
				M.D.	°	'	
				17	2	S. 59	
				18	1	N. 10	
				19	5	22	
				20	9	26	
				21	13	7	
				22	16	9	
				23	18	16	
				24	19	13	
				M.D.	°	'	
				25	18	S. 5	
				26	17	2	
				27	14	4	
				28	11	1	
				29	7		
				30	2	4	
				31	1	S. 4	

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

MAY, 1868.

WEEK DAY.		MONTH DAY.		WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.		
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		D.		
				H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.			
P.	1	0	58	30	2	1	40	30	5	5	12	13	3	5	51	13	6	6	2	9	2	6	38	9	4	8	7	8'7		
S.	2	2	19	31	0	2	56	31	10	6	26	13	10	6	57	14	1	7	13	9	7	7	45	9	9	9	7	9'7		
S.	3	3	31	32	9	4	53	33	9	7	24	14	6	7	51	14	11	8	15	10	0	8	45	10	3	10	7	10'7		
M.	4	4	39	34	9	5	8	35	8	8	17	15	3	8	40	15	7	9	14	10	5	9	39	10	7	11	7	11'7		
Tu.	5	5	33	36	4	5	58	36	11	9	1	15	10	9	22	16	0	10	1	10	9	10	20	10	11	12	7	12'7		
W.	6	6	22	37	3	6	45	37	5	9	43	16	2	10	3	16	2	10	40	11	0	11	0	11	1	1	0	13'7		
Th.	7	7	6	37	6	7	25	37	6	10	22	16	2	10	39	16	1	11	20	11	1	11	38	11	0	14	7	14'7		
F.	8	7	43	37	2	8	1	36	9	10	55	15	11	11	13	15	9	11	57	10	11	—	—	—	—	—	—	15'7		
S.	9	8	18	36	3	8	35	35	9	11	31	15	6	11	50	15	2	0	16	10	9	0	34	10	7	16	7	16'7		
S.	10	8	52	35	1	9	9	34	5	—	—	—	—	0	10	14	10	0	53	10	5	1	13	10	2	17	7	17'7		
M.	11	9	26	33	7	9	43	32	8	0	30	14	6	0	51	14	2	1	32	10	0	1	52	9	9	18	7	18'7		
Tu.	12	10	0	31	9	10	17	30	10	1	14	13	9	1	37	13	5	2	14	7	7	2	36	9	4	19	7	19'7		
W.	13	10	35	30	0	10	56	29	1	2	0	13	1	2	25	12	9	2	59	9	2	3	23	9	0	20	7	20'7		
Th.	14	11	22	28	6	11	53	27	11	2	52	12	6	3	25	12	3	3	51	8	10	4	23	8	9	21	7	21'7		
P.	15	—	—	—	—	0	26	27	8	4	0	12	2	4	37	12	2	4	57	8	7	5	30	8	7	22	7	22'7		
S.	16	1	0	27	10	1	35	28	1	5	13	12	3	5	47	12	6	6	3	8	8	6	34	8	10	23	7	23'7		
S.	17	2	8	28	8	2	41	29	4	6	17	12	9	6	45	13	1	7	4	9	0	7	32	9	3	24	7	24'7		
M.	18	3	13	30	3	3	43	31	2	7	11	13	5	7	35	13	10	7	59	9	5	8	25	9	7	25	7	25'7		
Tu.	19	4	14	32	2	4	39	33	3	7	58	14	3	8	18	14	7	8	51	9	10	9	14	10	1	26	7	26'7		
W.	20	5	4	34	2	5	28	35	2	8	37	14	11	8	56	15	4	9	35	10	3	9	56	10	6	27	7	27'7		
Th.	21	5	52	36	1	6	16	36	9	9	16	15	8	9	37	15	11	10	15	10	8	10	35	10	10	28	7	28'7		
	22	6	38	37	2	7	0	37	7	9	57	16	1	10	16	16	3	10	54	11	0	11	14	11	1	29	7	29'7		
	23	7	21	38	0	7	42	38	1	10	35	16	4	10	54	16	4	11	34	11	2	11	56	11	1	30	7	30'7		
	24	8	4	38	0	8	25	37	10	11	15	16	3	11	38	16	2	—	—	—	—	0	18	11	0	31	7	31'7		
	25	8	46	37	6	9	9	37	1	—	—	—	—	0	2	15	11	0	41	10	11	1	5	10	10	3	32	7	32'7	
	26	9	32	36	5	9	55	35	6	0	29	15	8	0	57	15	4	1	31	10	8	1	58	10	5	33	7	33'7		
	27	10	18	34	7	10	41	33	8	1	26	15	0	1	55	14	7	2	26	10	3	2	55	10	0	34	7	34'7		
Th.	28	11	7	32	9	11	35	31	10	2	26	14	3	3	0	14	0	3	25	10	10	3	58	9	8	35	7	35'7		
P.	29	—	—	—	—	0	6	31	3	3	37	13	9	4	14	13	7	4	34	9	6	5	10	9	4	36	7	36'7		
S.	30	0	41	30	11	1	16	30	11	4	54	13	6	5	29	13	8	5	45	9	4	6	18	9	5	37	7	37'7		
S.	31	1	51	31	2	2	27	31	6	6	1	13	10	6	32	14	0	6	48	9	7	7	19	9	8	38	7	38'7		
Half Mean Spring Range.				18ft. 7in.								8ft. 0in.								5ft. 6in.										

Half Mean Spring Range. } 18 ft. 7 in.

8 ft. 0 in.

5 ft. 6 in.

Equation of Time at Noon.

M.D.	M.	A.	Add.	M.D.	M.	A.	Add.	M.D.	M.	A.	Add.	M.D.	M.	A.	Add.
1	3	4		9	3	46		17	3	50		25	3	17	
2	3	11		10	3	48		18	3	48		26	3	11	
3	3	18		11	3	50		19	3	45		27	3	4	
4	3	24		12	3	51		20	3	42		28	2	57	
5	3	29		13	3	52		21	3	38		29	2	49	
6	3	34		14	3	52		22	3	33		30	2	41	
7	3	39		15	3	52		23	3	29		31	2	33	
8	3	42		16	3	51		24	3	23					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m.; HOLYHEAD add 18 m.; KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.														
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.											
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.										
F.	1	8a 2	5 43	8 3	6 21	8 3	3 21	6 2	3 55	6 5	0 17	8 10	0 55	8 11															
S.	2	8 54	6 58	8 4	7 31	8 6	4 25	6 7	4 50	6 10	1 31	9 2	2 4	9 3															
S.	3	9 44	7 59	8 8	8 26	8 11	5 13	7 0	5 37	7 2	2 31	9 9	2 57	10 1															
M.	4	10 34	8 51	9 1	9 15	9 3	6 1	7 4	6 25	7 6	3 21	10 5	3 42	10 8															
Tu.	5	11 24	9 37	9 5	9 58	9 6	6 48	7 7	7 11	7 9	4 3	10 11	4 24	11 1															
W.	6	morn.	10 19	9 6	10 39	9 7	7 33	7 9	7 53	7 10	4 46	11 4	5 8	11 1															
Th.	7	0 13	10 58	9 7	11 16	9 6	8 12	7 10	8 29	7 9	5 28	11 5	5 46	11 1															
F.	8	1 3	11 33	9 5	11 51	9 4	8 45	7 8	9 2	7 6	6 3	11 2	6 21	11 1															
S.	9	1 53	—	—	0 10	9 3	9 19	7 3	9 36	7 1	6 40	10 9	6 58	10 1															
S.	10	2 43	0 29	9 2	0 48	9 0	9 53	6 11	10 11	6 8	7 17	10 1	7 35	9 1															
M.	11	3 33	1 8	8 11	1 30	8 10	10 31	6 6	10 52	6 3	7 54	9 6	8 15	9 1															
Tu.	12	4 21	1 54	8 8	2 18	8 6	11 19	6 0	11 47	5 9	8 38	8 10	9 2	8 1															
W.	13	5 8	2 42	8 4	3 6	8 3	—	—	0 19	5 6	9 30	8 4	10 0	8 1															
Th.	14	5 53	3 34	8 1	4 5	8 0	0 53	5 4	1 31	5 4	10 34	8 1	11 9	8 1															
F.	15	6 38	4 38	8 0	5 11	7 11	2 12	5 4	2 48	5 5	11 44	8 0	—	—															
S.	16	7 22	5 44	7 11	6 17	7 11	3 22	5 7	3 52	5 10	0 18	8 1	0 51	8 1															
S.	17	8 6	6 49	8 0	7 18	8 1	4 18	6 1	4 42	6 3	1 22	8 5	1 51	8 1															
M.	18	8 51	7 45	8 3	8 9	8 5	5 2	6 5	5 22	6 7	2 16	8 11	2 40	9 1															
Tu.	19	9 38	8 32	8 8	8 52	8 10	5 43	6 10	6 2	7 0	3 3	9 7	3 21	9 1															
W.	20	10 27	9 12	9 1	9 32	9 3	6 22	7 2	6 43	7 4	3 39	10 3	3 58	10 1															
Th.	21	11 18	9 52	9 4	10 13	9 5	7 5	7 6	7 27	7 8	4 18	10 10	4 40	11 1															
F.	22	0a 13	10 33	9 6	10 53	9 7	7 47	7 9	8 6	7 10	5 1	11 3	5 22	11 1															
S.	23	1 11	11 12	9 7	11 32	9 7	8 25	7 11	8 45	7 11	5 42	11 6	6 2	11 1															
S.	24	2 10	11 54	9 6	—	—	9 5	7 9	9 26	7 8	6 24	11 4	6 47	11 1															
M.	25	3 10	0 17	9 6	0 41	9 5	9 47	7 6	10 10	7 4	7 10	10 11	7 34	10 1															
Tu.	26	4 9	1 7	9 4	1 36	9 3	10 36	7 2	11 4	6 11	8 0	10 4	8 27	10 1															
W.	27	5 6	2 6	9 1	2 37	8 11	11 39	6 8	—	—	8 56	9 9	9 30	9 1															
Th.	28	6 0	3 9	8 9	3 42	8 8	0 17	6 4	0 59	6 2	10 7	9 3	10 46	9 1															
F.	29	6 52	4 16	8 7	4 51	8 6	1 42	6 1	2 26	6 1	11 23	9 0	11 59	9 1															
S.	30	7 42	5 26	8 5	5 59	8 5	3 4	6 2	3 37	6 5	—	—	0 33	9 1															
S.	31	8 30	6 32	8 5	7 5	8 5	4 4	6 7	4 30	6 9	1 6	9 2	1 38	9 1															
Half Mean Spring Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.														
Phases of the Moon.															Moon's Declination at Noon.														
Full - - - - - 6 6 37 Afternoon.															M.D. 1 10 N. 8 9 18 S. 28 17 2 5.59 25 18 N. 53														
Last Quarter 14 5 15 Afternoon.															M.D. 2 5 57 10 19 9 18 1 N. 10 26 17 22														
New - - - - - 22 6 36 Morning.															M.D. 3 1 29 11 18 56 19 5 22 27 14 43														
First Quarter 28 11 42 Afternoon.															M.D. 4 3 S. 1 12 17 53 20 9 26 28 11 14														
															M.D. 5 7 18 13 16 3 21 13 7 29 7 9														
In Perigee - - 13 11 0 Morning.															M.D. 6 11 10 14 13 32 22 16 9 30 2 44														
In Apogee - - 25 9 0 Morning.															M.D. 7 14 24 15 10 27 23 18 16 31 1 S. 44														
															M.D. 8 16 52 16 6 54 24 19 13														

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, — for BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

MAY, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's Age at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D.
F.	1	—	—	0 7 11 9	—	—	0 5 9 8	—	—	0 19 10 5	8'7			
S.	2	0 43 12 1	1 15 12 6	0 43 9 10	1 20 10 1	0 54 10 7	1 28 10 10	9'7						
S.	3	1 42 12 11	2 9 13 4	1 53 10 4	2 25 10 8	2 2 11 2	2 37 11 6	10'7						
M.	4	2 36 13 9	3 1 14 1	2 54 11 0	3 19 11 3	3 9 11 9	3 37 12 0	11'7						
Tu.	5	3 23 14 4	3 44 14 7	3 43 11 6	4 7 11 8	4 3 12 2	4 28 12 4	12'7						
W.	6	4 5 14 9	4 26 14 11	4 29 11 9	4 51 11 10	4 52 12 5	5 14 12 6	0						
Th.	7	4 46 15 0	5 5 14 11	5 12 11 11	5 31 11 10	5 33 12 6	5 52 12 6	14'7						
F.	8	5 23 14 9	5 42 14 7	5 50 11 9	6 9 11 7	6 11 12 5	6 30 12 3	15'7						
S.	9	6 1 14 3	6 19 13 11	6 27 11 5	6 45 11 3	6 48 12 1	7 6 12 0	16'7						
S.	10	6 38 13 7	6 57 13 3	7 3 11 0	7 21 10 9	7 24 11 10	7 42 11 7	17'7						
M.	11	7 17 12 10	7 39 12 5	7 40 10 6	8 0 10 2	8 0 11 5	8 18 11 2	18'7						
Tu.	12	8 1 12 0	8 24 11 6	8 19 9 11	8 39 9 8	8 37 10 11	8 55 10 8	19'7						
W.	13	8 48 11 1	9 13 10 9	9 0 9 5	9 22 9 2	9 14 10 5	9 37 10 2	20'7						
Th.	14	9 44 10 6	10 17 10 4	9 47 9 0	10 17 8 10	10 7 9 11	10 39 9 9	21'7						
F.	15	10 52 10 4	11 29 10 6	10 51 8 10	11 27 8 10	11 12 9 7	11 44 9 7	22'7						
S.	16	—	0 3 10 8	—	0 1 8 11	—	0 15 9 8	23'7						
S.	17	0 34 11 0	1 3 11 4	0 33 9 2	1 5 9 4	0 45 9 10	1 14 10 1	24'7						
M.	18	1 29 11 9	1 52 12 2	1 36 9 7	2 4 9 11	1 44 10 4	2 14 10 8	25'7						
Tu.	19	2 15 12 7	2 36 13 0	2 31 10 2	2 53 10 6	2 43 11 0	3 8 11 3	26'7						
W.	20	2 57 13 5	3 18 13 10	3 15 10 10	3 38 11 1	3 33 11 7	3 57 11 10	27'7						
Th.	21	3 39 14 2	4 0 14 6	4 0 11 4	4 22 11 7	4 21 12 1	4 45 12 4	28'7						
F.	22	4 20 14 10	4 40 15 0	4 44 11 9	5 6 11 11	5 7 12 5	5 27 12 6	29'7						
S.	23	5 0 15 2	5 22 15 3	5 27 12 0	5 49 12 0	5 48 12 8	6 10 12 8	30'7						
S.	24	5 45 15 2	6 8 15 0	6 12 12 0	6 34 11 11	6 33 12 8	6 55 12 8	31'7						
M.	25	6 31 14 9	6 56 14 6	6 56 11 9	7 21 11 7	7 17 12 7	7 40 12 5	32'7						
Tu.	26	7 23 14 2	7 51 13 9	7 46 11 4	8 11 11 1	8 6 12 3	8 29 12 0	33'7						
W.	27	8 20 13 3	8 50 12 9	8 36 10 9	9 3 10 6	8 53 11 9	9 19 11 6	34'7						
Th.	28	9 22 12 4	9 56 12 0	9 31 10 3	10 0 10 0	9 47 11 3	10 19 11 0	35'7						
F.	29	10 31 11 10	11 9 11 10	10 31 9 11	11 7 9 10	10 53 10 9	11 27 10 7	36'7						
S.	30	11 45 11 11	—	11 42 9 9	—	11 59 10 6	—	37'7						
S.	31	0 18 12 1	0 50 12 4	0 16 9 11	0 51 10 0	0 30 10 8	1 1 10 9	38'7						
Half Moon Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
1	3 4		9	3 46		17	3 50		25	3 17	
2	3 11		10	3 48		18	3 48		26	3 11	
3	3 18		11	3 50		19	3 45		27	3 4	
4	3 24		12	3 51		20	3 42		28	2 57	
5	3 29		13	3 52		21	3 38		29	2 49	
6	3 34		14	3 52		22	3 33		30	2 41	
7	3 39		15	3 52		23	3 29		31	2 33	
8	3 42		16	3 51		24	3 23				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

JUNE, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9 21 9	0 23	15 11	0 53	16 3	2 8	13 10	2 40	13 10	8 13	11 3	8 44	11 6
Tu.	2	10 7	1 21	16 8	1 47	17 1	3 10	14 5	3 36	14 4	9 13	11 8	9 41	11 10
W.	3	10 57	2 11	17 6	2 32	17 9	4 2	14 9	4 26	14 9	10 6	12 0	10 28	12 1
Th.	4	11 46	2 53	18 1	3 15	18 3	4 49	14 11	5 10	15 1	10 49	12 2	11 11	12 3
F.	5	morn.	3 34	18 3	3 54	18 2	5 30	15 2	5 49	15 3	11 30	12 3	11 50	12 2
S.	6	0 36	4 15	18 0	4 34	17 10	6 8	15 1	6 26	15 3	—	—	0 11	12 1
S.	7	1 26	4 50	17 8	5 7	17 6	6 43	14 10	6 59	15 0	0 31	12 0	0 49	11 11
M.	8	2 14	5 25	17 3	5 42	17 0	7 15	14 4	7 31	14 8	1 7	11 10	1 26	11 8
Tu.	9	3 2	6 0	16 8	6 19	16 4	7 47	13 10	8 3	14 1	1 44	11 7	2 2	11 6
W.	10	3 48	6 38	15 11	6 58	15 6	8 19	13 2	8 36	13 6	2 20	11 4	2 39	11 2
Th.	11	4 33	7 20	15 2	7 42	14 9	8 53	12 7	9 13	12 11	2 59	11 0	3 20	10 10
F.	12	5 17	8 5	14 4	8 31	14 1	9 34	12 0	9 56	12 4	3 41	10 8	4 3	10 6
S.	13	6 1	8 58	13 11	9 29	13 9	10 22	11 8	10 49	12 1	4 28	10 4	4 54	10 3
S.	14	6 44	10 1	13 10	10 33	13 11	11 20	11 7	11 57	12 2	5 23	10 2	5 54	10 1
M.	15	7 29	11 5	14 2	11 39	14 6	—	—	0 34	12 0	6 24	10 1	6 55	10 2
Tu.	16	8 16	—	—	0 11	14 11	1 11	12 8	1 47	12 9	7 26	10 5	7 58	10 9
W.	17	9 5	0 38	15 6	1 5	16 0	2 21	13 3	2 52	13 8	8 28	11 1	8 56	11 4
Th.	18	9 58	1 31	16 8	1 56	17 3	3 20	14 0	3 46	14 4	9 23	11 8	9 50	11 11
F.	19	10 55	2 20	17 11	2 43	18 6	4 12	14 8	4 38	15 0	10 15	12 2	10 39	12 5
S.	20	11 54	3 7	19 0	3 31	19 4	5 2	15 3	5 26	15 8	11 3	12 7	11 27	12 9
S.	21	0 25 6	3 55	19 7	4 20	19 8	5 51	15 8	6 15	16 1	11 51	12 11	—	—
M.	22	1 57	4 44	19 9	5 7	19 8	6 38	15 10	7 1	16 3	0 16	12 11	0 42	12 11
Tu.	23	2 57	5 31	19 6	5 54	19 3	7 24	15 9	7 48	16 2	1 7	12 11	1 31	12 10
W.	24	3 54	6 19	19 0	6 46	18 6	8 12	15 5	8 37	15 9	1 56	12 9	2 21	12 8
Th.	25	4 48	7 13	17 11	7 40	17 4	9 0	14 9	9 23	15 0	2 47	12 5	3 13	12 2
F.	26	5 39	8 8	16 9	8 37	16 1	9 47	14 0	10 13	14 2	3 39	11 11	4 5	11 8
S.	27	6 29	9 5	15 8	9 34	15 4	10 41	13 3	11 9	13 6	4 33	11 5	5 1	11 2
S.	28	7 17	10 7	15 2	10 43	15 0	11 39	12 10	—	—	5 29	10 11	5 59	10 5
M.	29	8 5	11 17	15 0	11 50	15 1	0 15	13 1	0 53	12 10	6 32	10 7	7 5	10 8
Tu.	30	8 54	—	—	0 22	15 3	1 29	13 2	2 3	13 2	7 38	10 9	8 11	10 11

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Full	5	6	55	Morning.	1	6	8. 4	9	16	8. 55	17	11	N. 54	25	8	N. 3	25	8	N. 3
Last Quarter	13	10	14	Morning.	2	10	2	10	14	38	18	14	57	26	4		26	4	
New	20	2	45	Afternoon.	3	13	28	11	11	44	19	17	31	27	0	S. 31	27	0	S. 31
First Quarter	27	5	51	Morning.	4	16	12	12	8	21	20	19	2	28	4	S. 5	28	4	S. 5
In Apogee	10	4	0	Morning.	5	18	7	13	4	35	21	19	16	29	9		29	9	
In Perigee	22	6	0	Morning.	6	19	9	14	0	33	22	18	10	30	12	34	30	12	34
					7	19	16	15	3	N. 36	23	15	50						
					8	18	30	16	7	42	24	12	29						

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—
Brest add 18 m. Devonport add 17 m. Portsmouth add 4 m.

JUNE, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
M.	1	7 38 16 4	8 9 16 8	9 30 14 5	10 0 14 8	10 54 16 11	11 27 17 2	10 2						
Tu.	2	8 37 16 11	9 4 17 3	10 28 14 10	10 55 15 1	11 56 17 4	—	11 2						
W.	3	9 29 17 5	9 53 17 7	11 20 15 3	11 44 15 5	0 24 17 7	0 49 17 10	12 2						
Th.	4	10 16 17 10	10 38 17 11	—	0 5 15 6	1 13 18 0	1 36 18 2	13 2						
F.	5	11 0 17 11	11 22 17 11	0 26 15 8	0 47 15 8	1 58 18 4	2 18 18 5	0						
S.	6	11 44 17 10	—	1 7 15 8	1 26 15 8	2 38 18 6	2 57 18 7	15 2						
S.	7	0 5 17 9	0 23 17 8	1 46 15 7	2 4 15 5	3 15 18 6	3 34 18 5	16 2						
M.	8	0 42 17 6	1 3 17 3	2 21 15 4	2 38 15 2	3 51 18 4	4 8 18 3	17 2						
Tu.	9	1 22 17 1	1 41 16 11	2 55 15 0	3 12 14 10	4 25 18 1	4 43 17 11	18 2						
W.	10	2 0 16 9	2 20 16 5	3 30 14 8	3 49 14 5	5 1 17 9	5 20 17 6	19 2						
Th.	11	2 40 16 2	3 1 15 10	4 8 14 2	4 28 13 11	5 39 17 3	5 58 17 12	20 2						
F.	12	3 22 15 7	3 44 15 4	4 50 13 9	5 13 13 7	6 19 16 10	6 43 16 7	21 2						
S.	13	4 8 15 0	4 33 14 9	5 37 13 5	6 5 13 3	7 6 16 5	7 33 16 3	0						
S.	14	4 59 14 7	5 26 14 6	6 36 13 1	7 8 13 0	8 1 16 1	8 33 16 0	23 2						
M.	15	5 54 14 7	6 22 14 9	7 43 13 1	8 15 13 3	9 8 16 0	9 42 16 0	24 2						
Tu.	16	6 52 15 1	7 24 15 6	8 46 13 5	9 17 13 9	10 13 16 1	10 44 16 3	25 2						
W.	17	7 53 16 0	8 21 16 5	9 49 14 1	10 14 14 5	11 14 16 6	11 44 16 10	26 2						
Th.	18	8 47 16 11	9 13 17 4	10 40 14 8	11 5 15 0	—	0 12 17 2	27 2						
F.	19	9 39 17 9	10 4 18 2	11 29 15 4	11 52 15 7	0 35 17 6	0 59 17 11	28 2						
S.	20	10 30 18 6	10 56 18 10	—	0 16 15 10	1 25 18 3	1 49 18 7	0						
S.	21	11 23 19 0	11 49 19 2	0 39 16 1	1 3 16 4	2 11 18 11	2 35 19 2	0 9						
M.	22	—	0 15 19 3	1 26 16 5	1 51 16 6	2 57 19 5	3 21 19 7	1 9						
Tu.	23	0 41 19 3	1 8 19 2	2 15 16 5	2 38 16 5	3 44 19 7	4 7 19 7	2 9						
W.	24	1 34 19 0	2 1 18 10	3 1 16 4	3 24 16 2	4 31 19 6	4 55 19 4	3 9						
Th.	25	2 28 18 6	2 55 18 1	3 49 15 11	4 16 15 8	5 21 19 2	5 48 18 11	4 9						
F.	26	3 21 17 8	3 47 17 2	4 43 15 4	5 10 15 0	6 14 18 7	6 41 18 3	5 9						
S.	27	4 14 16 9	4 40 16 3	5 39 14 8	6 10 14 5	7 8 17 10	7 38 17 6	0						
S.	28	5 5 15 10	5 32 15 7	6 41 14 1	7 13 13 11	8 9 17 3	8 42 17 0	7 9						
M.	29	6 2 15 5	6 32 15 5	7 48 13 10	8 25 13 10	9 16 16 10	9 49 16 8	8 9						
Tu.	30	7 4 15 7	7 37 15 9	8 57 14 0	9 29 14 1	10 21 16 8	10 53 16 8	9 9						
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	2 24	Add.	9	1 1	Add.	17	0 39	Sub.	25	2 23	Sub.
2	2 15		10	0 49		18	0 52		26	2 35	
3	2 5		11	0 37		19	1 5		27	2 48	
4	1 55		12	0 25		20	1 18		28	3 0	
5	1 45	Sub.	13	0 12	Sub.	21	1 31	Sub.	29	3 12	Sub.
6	1 34		14	0 0		22	1 44		30	3 24	
7	1 23		15	0 13		23	1 57				
8	1 12		16	0 26		24	2 10				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. SHEERNESS subtract 8 m. LONDON 0 m.

TIDE TABLES FOR THE

JUNE, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.							
M.	1	9a19	8 37 10 7	9 7 10 8	2 59 18 3	3 28 18 8	—	—	0 20 13 6																	
Tu.	2	10 7	9 36 10 10	10 4 11 0	3 57 19 0	4 24 19 4	0 47 12 9	1 15 13 0																		
W.	3	10 57	10 31 11 1	10 55 11 3	4 49 19 8	5 12 19 10	1 42 13 3	2 7 13 5																		
Th.	4	11 46	11 18 11 4	11 39 11 5	5 33 20 0	5 55 20 1	2 30 13 6	2 50 13 0																		
F.	5	morn.	12 0 11 5	—	6 17 20 1	6 38 20 1	3 10 13 9	3 30 13 9																		
S.	6	0 36	0 20 11 4	0 39 11 3	6 58 20 1	7 18 20 0	3 50 13 9	4 10 13 9																		
S.	7	1 26	0 59 11 2	1 18 11 1	7 38 19 10	7 55 19 8	4 28 13 8	4 44 13 6																		
M.	8	2 14	1 36 11 0	1 54 10 10	8 12 19 6	8 30 19 3	5 1 13 4	5 19 13 2																		
Tu.	9	3 2	2 12 10 9	2 30 10 7	8 48 19 0	9 6 18 8	5 38 12 11	5 57 12 6																		
W.	10	3 48	2 48 10 6	3 7 10 4	9 25 18 4	9 44 18 0	6 17 12 5	6 38 12 2																		
Th.	11	4 33	3 26 10 3	3 46 10 1	10 3 17 8	10 26 17 4	6 59 11 11	7 22 11 9																		
F.	12	5 17	4 6 10 0	4 27 9 11	10 50 17 1	11 17 16 10	7 45 11 6	8 9 11 4																		
S.	13	6 1	4 50 9 10	5 16 9 9	11 48 16 7	—	8 37 11 2	9 7 11 1																		
S.	14	6 44	5 44 9 8	6 15 9 8	0 21 16 5	0 53 16 4	9 39 11 0	10 13 11 0																		
M.	15	7 29	6 50 9 9	7 23 9 10	1 23 16 4	1 51 16 6	10 43 11 1	11 12 11 2																		
Tu.	16	8 16	7 54 10 0	8 25 10 2	2 19 16 9	2 47 17 3	11 40 11 7	—																		
W.	17	9 5	8 54 10 4	9 21 10 6	3 15 17 9	3 42 18 4	0 7 11 11	0 33 12 0																		
Th.	18	9 58	9 48 10 9	10 15 11 0	4 9 18 10	4 34 19 4	0 59 12 8	1 25 13 0																		
F.	19	10 55	10 40 11 2	11 4 11 5	4 58 19 9	5 21 20 2	1 51 13 4	2 16 13 0																		
S.	20	11 54	11 28 11 7	11 52 11 8	5 44 20 6	6 9 20 10	2 41 13 11	3 4 14 0																		
S.	21	0a56	—	0 16 11 9	6 34 21 1	6 58 21 3	3 27 14 5	3 50 14 0																		
M.	22	1 57	0 39 11 10	1 4 11 10	7 23 21 5	7 48 21 5	4 14 14 10	4 38 14 10																		
Tu.	23	2 57	1 29 11 9	1 53 11 8	8 11 21 5	8 35 21 3	5 1 14 9	5 25 14 0																		
W.	24	3 54	2 17 11 7	2 42 11 6	8 59 21 0	9 25 20 8	5 50 14 4	6 16 14 0																		
Th.	25	4 48	3 8 11 4	3 34 11 2	9 51 20 3	10 18 19 9	6 44 13 9	7 13 13 0																		
F.	26	5 39	4 0 11 0	4 26 10 10	10 46 19 3	11 17 18 10	7 42 13 1	8 11 13 0																		
S.	27	6 29	4 53 10 8	5 23 10 6	11 52 18 5	—	8 42 12 6	9 14 12 0																		
S.	28	7 17	5 51 10 4	6 20 10 3	0 27 18 0	0 57 17 8	9 45 12 0	10 18 11 0																		
M.	29	8 5	6 55 10 3	7 33 10 3	1 29 17 6	2 0 17 5	10 52 11 9	11 22 11 0																		
Tu.	30	8 54	8 5 10 3	8 36 10 4	2 29 17 7	2 58 17 10	11 31 11 11	—																		
Half Mean Spring Range			5ft. 9in.				10ft. 5in.				7ft. 2in.															

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	5	6	55	Morning.
Last Quarter -	13	10	14	Morning.
New - - - - -	20	2	45	Afternoon.
First Quarter	27	5	51	Morning.
In Perigee - - 10 4 0 Morning.				
In Apogee - - 22 6 0 Morning.				

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	68.	4	9	168.	55	17	11N.	34	25	8N.	2
2	10	2	10	14	38	18	14	57	26	4	
3	13	28	11	11	44	19	17	31	27	08.	3
4	16	12	12	8	21	20	19	2	28	4	5
5	18	7	13	4	35	21	19	16	29	9	6
6	19	9	14	0	33	22	18	10	30	12	3
7	19	16	15	3	N.36	23	15	50			
8	18	30	16	7	42	24	12	29			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

JUNE, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
M.	1	0	5	11	3	0	33	11	6	11	26	14	2	11	53	14	4	5	28	10	10	5	55	11	1	10.2
Tu.	2	0	59	11	8	1	24	11	10	—	—	—	—	0	18	14	8	6	19	11	5	6	42	11	9	11.2
W.	3	1	48	12	0	2	11	12	3	0	43	14	11	1	7	15	3	7	3	12	1	7	21	12	4	12.2
Th.	4	2	32	12	5	2	52	12	7	1	28	15	5	1	48	15	7	7	38	12	7	7	58	12	9	13.2
F.	5	3	11	12	8	3	30	12	8	2	9	15	9	2	29	15	9	8	16	12	9	8	35	12	8	14.2
S.	6	3	50	12	8	4	10	12	7	2	48	15	9	3	7	15	7	8	54	12	7	9	13	12	5	15.2
S.	7	4	29	12	5	4	46	12	3	3	25	15	5	3	42	15	3	9	31	12	3	9	49	12	0	16.2
M.	8	5	4	12	1	5	23	11	10	4	0	15	0	4	18	14	10	10	8	11	9	10	27	11	7	17.2
Tu.	9	5	42	11	8	6	1	11	6	4	37	14	7	4	55	14	5	10	46	11	3	11	6	11	0	18.2
W.	10	6	20	11	4	6	40	11	1	5	14	14	2	5	35	13	11	11	27	10	9	11	49	10	6	19.2
Th.	11	7	1	10	11	7	24	10	8	5	57	13	8	6	20	13	5	—	—	—	—	0	12	10	3	20.2
F.	12	7	49	10	5	8	15	10	2	6	44	13	2	7	10	12	11	0	36	10	0	1	1	9	10	21.2
S.	13	8	45	10	0	9	17	9	11	7	40	12	9	8	11	12	8	1	30	9	8	2	2	9	7	22.2
S.	14	9	51	9	10	10	25	9	11	8	43	12	7	9	19	12	7	2	35	9	6	3	12	9	6	23.2
M.	15	10	55	10	1	11	24	10	4	9	50	12	9	10	19	12	11	3	46	9	7	4	17	9	9	24.2
Tu.	16	11	53	10	7	—	—	—	—	10	47	13	2	11	15	13	6	4	47	9	11	5	17	10	2	25.2
W.	17	0	21	10	10	0	46	11	2	11	40	13	10	—	—	—	—	5	42	10	6	6	6	10	11	26.2
Th.	18	1	10	11	5	1	33	11	9	0	4	14	2	0	27	14	7	6	28	11	5	6	49	11	11	27.2
F.	19	1	57	12	1	2	20	12	6	0	51	15	0	1	15	15	6	7	10	12	4	7	30	12	10	28.2
S.	20	2	42	12	10	3	4	13	1	1	38	15	11	2	1	16	3	7	52	13	3	8	14	13	6	29.2
S.	21	3	27	13	4	3	51	13	6	2	25	16	6	2	48	16	8	8	36	13	8	8	59	13	8	30.2
M.	22	4	15	13	8	4	40	13	7	3	11	16	9	3	34	16	8	9	23	13	8	9	48	13	7	31.2
Tu.	23	5	4	13	5	5	29	13	3	3	58	16	7	4	23	16	4	10	13	13	4	10	39	13	1	32.2
W.	24	5	54	13	1	6	20	12	11	4	49	16	2	5	15	16	0	11	5	12	10	11	34	12	6	33.2
Th.	25	6	47	12	8	7	15	12	5	5	43	15	8	6	11	15	4	—	—	—	—	0	3	12	1	34.2
F.	26	7	44	12	0	8	15	11	8	6	40	14	11	7	10	14	6	0	32	11	9	1	2	11	5	35.2
S.	27	8	49	11	3	9	23	11	0	7	44	14	2	8	17	13	10	1	34	11	1	2	7	10	10	36.2
S.	28	9	56	10	11	10	30	10	9	8	49	13	8	9	24	13	6	2	41	10	7	3	17	10	5	37.2
M.	29	11	3	10	9	11	35	10	10	9	58	13	6	10	28	13	6	3	56	10	4	4	28	10	3	38.2
Tu.	30	—	—	—	—	0	4	11	0	10	57	13	7	11	26	13	8	4	59	10	3	5	29	10	4	39.2
Half Mean Spring Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	2	24	Add.	9	1	1		17	0	39	Sub.	25	2	23	Sub.
2	2	15		10	0	49		18	0	52		26	2	35	
3	2	5		11	0	37		19	1	5		27	2	48	
4	1	55		12	0	25		20	1	18		28	3	0	
5	1	45		13	0	12		21	1	31		29	3	12	
6	1	34		14	0	0	Sub.	22	1	44		30	3	24	
7	1	23		15	0	13		23	1	57					
8	1	12		16	0	26		24	2	10					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

JUNE, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.						
		H.	M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.				
M.	1	9a19	8	35	8	11		9	5	9	0	8	4	22	10	8	31	23	3	2	28	17	9	3	1	18	2				
Tu.	2	10 7	9	34	9	1		10	1	9	2	8	57	23	8	9	22	24	1	3	31	18	7	4	1	19	0				
W.	3	10 57	10	26	9	3		10	50	9	3	9	46	24	5	10	7	24	7	4	28	19	4	4	53	19	7				
Th.	4	11 46	11	13	9	4		11	35	9	4	10	27	24	9	10	48	24	10	5	17	19	10	5	40	19	11				
F.	5	morn.	11	57	9	4		—	—	11	9	24	11	11	29	24	11	6	1	20	0	6	21	20	0	6	21	20	0		
S.	6	0 36	0	18	9	5		0	38	9	5	11	50	24	10	—	—	6	41	19	11	7	0	19	10	7	0	19	10		
S.	7	1 26	0	58	9	5		1	16	9	4	0	9	24	8	0	27	24	6	7	17	19	8	7	34	19	5	7	34	19	5
M.	8	2 14	1	33	9	3		1	51	9	3	0	44	24	3	1	2	24	0	7	52	19	2	8	10	18	11	8	10	18	11
Tu.	9	3 2	2	9	9	2		2	27	9	1	1	20	23	7	1	37	23	2	8	28	18	7	8	47	18	5	8	47	18	5
W.	10	3 48	2	45	9	0		3	3	8	11	1	55	22	9	2	14	22	4	9	6	17	11	9	24	17	6	9	24	17	6
Th.	11	4 33	3	22	8	10		3	43	8	9	2	33	21	11	2	54	21	7	9	43	17	2	10	3	16	17	10	3	16	17
F.	12	5 17	4	5	8	8		4	27	8	7	3	15	21	3	3	38	20	10	10	24	16	7	10	46	16	2	10	46	16	2
S.	13	6 1	4	52	8	6		5	19	8	5	4	5	20	6	4	35	20	2	11	9	15	10	11	35	15	8	11	35	15	8
S.	14	6 44	5	49	8	4		6	20	8	3	5	7	20	1	5	43	20	2	—	—	—	—	0	2	15	8	0	2	15	8
M.	15	7 29	6	50	8	3		7	20	8	4	6	17	20	4	6	49	20	8	0	31	15	8	1	3	15	17	1	3	15	17
Tu.	16	8 16	7	51	8	5		8	22	8	7	7	20	21	2	7	50	21	9	1	38	16	3	2	12	16	8	2	12	16	8
W.	17	9 5	8	51	8	9		9	18	8	11	8	17	22	4	8	43	23	0	2	43	17	3	3	13	17	17	3	13	17	17
Th.	18	9 58	9	45	9	1		10	11	9	3	9	7	23	8	9	31	24	3	3	42	18	7	4	10	19	2	4	10	19	2
F.	19	10 55	10	36	9	4		11	1	9	5	9	54	24	10	10	17	25	4	4	38	19	9	5	5	20	3	5	5	20	3
S.	20	11 54	11	27	9	7		11	53	9	9	10	41	25	9	11	5	26	1	5	32	20	9	5	57	21	4	5	57	21	4
S.	21	0a56	—	—	—	—		0	18	9	10	11	30	26	6	11	55	26	8	6	22	21	5	6	46	21	8	6	46	21	8
M.	22	1 57	0	43	9	11		1	8	9	11	—	—	—	—	0	20	26	9	7	10	21	8	7	33	21	7	7	33	21	7
Tu.	23	2 57	1	33	9	11		1	57	9	11	0	44	26	9	1	8	26	6	7	57	21	5	8	22	21	7	8	22	21	7
W.	24	3 54	2	21	9	11		2	46	9	10	1	32	26	2	1	56	25	9	8	48	20	11	9	13	20	8	9	13	20	8
Th.	25	4 48	3	11	9	8		3	36	9	7	2	22	25	2	2	48	24	8	9	38	19	11	10	3	19	5	10	3	19	5
F.	26	5 39	4	2	9	5		4	29	9	4	3	14	24	1	3	41	23	5	10	28	18	10	10	53	18	3	10	53	18	3
S.	27	6 29	4	57	9	2		5	26	9	0	4	10	22	9	4	41	22	3	11	18	17	8	11	40	17	3	11	40	17	3
S.	28	7 17	5	54	8	10		6	25	8	8	5	13	21	10	5	48	21	8	—	—	—	—	0	9	17	0	0	9	17	0
M.	29	8 5	6	59	8	7		7	31	8	7	6	27	21	7	7	1	21	8	0	40	16	9	1	15	16	9	1	15	16	9
Tu.	30	8 54	8	3	8	7		8	35	8	8	7	32	21	10	8	3	22	1	1	51	16	10	2	27	17	0	2	27	17	0

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	5	6	55	Morning.
Last Quarter -	13	10	14	Morning.
New - - - - -	20	2	45	Afternoon.
First Quarter -	27	5	51	Morning.
In Apogee - - 10 4 0 Morning.				
In Perigee - - 22 6 0 Morning.				

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	6	S. 4	9	16	S. 55	17	11	N. 34	25	8	N. 27
2	10	2	10	14	38	18	14	57	26	4	1
3	13	28	11	11	44	19	17	31	27	0	S. 31
4	16	12	12	8	21	20	19	2	28	4	S. 56
5	18	7	13	4	35	21	19	16	29	9	0
6	19	9	14	0	33	22	18	10	30	13	34
7	19	16	15	3	N. 36	23	15	50			
8	18	30	16	7	42	24	12	29			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

JUNE, 1868.

Month Day.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age.					
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.							
	Time. H. M. F. L.	Height.	Time. H. M. F. L.	Height.	Time. H. M. F. L.	Height.	Time. H. M. F. L.	Height.	Time. H. M. F. L.	Height.	Time. H. M. F. L.	Height.						
1	3 23	2	3 36	32	7	7 0	14	3	7 27	14	5	7 49	9	10	8 18	10	0	10.
2	4 8	33	4 40	33	11	7 53	14	8	8 18	14	10	8 46	10	1	9 15	10	3	11.
3	5 9	34	5 34	34	11	8 41	15	1	9 1	15	2	9 40	10	4	10 1	10	5	12.
4	5 58	35	6 22	35	6	9 21	15	4	9 42	15	5	10 20	10	6	10 40	10	7	13.
5	6 44	35	7 4	35	6	10 2	15	4	10 21	15	4	10 59	10	8	11 18	10	8	C
6	7 25	35	7 45	35	4	10 39	15	3	10 56	15	2	11 38	10	7	11 57	10	6	15.
7	8 0	35	8 17	34	10	11 12	15	0	11 29	14	10	—	—	—	0 15	10	4	16.
8	8 34	34	8 51	34	2	11 48	14	8	—	—	—	0 33	10	3	0 52	10	2	17.
9	9 8	33	9 24	33	3	0 8	14	6	0 28	14	3	1 11	10	0	1 30	9	10	18.
10	9 41	32	9 57	32	0	0 48	14	0	1 9	13	9	1 49	9	8	2 9	9	6	19.
11	10 14	31	10 32	30	10	1 31	13	6	1 54	13	3	2 30	9	5	2 53	9	4	20.
12	10 51	30	11 13	29	8	2 17	13	1	2 42	12	11	3 16	9	2	3 41	9	1	21.
13	11 39	29	—	—	—	3 11	12	9	3 43	12	8	4 10	9	0	4 41	8	11	C
14	0 9	28	0 39	28	10	4 16	12	7	4 52	12	8	5 13	8	10	5 43	8	10	23.
15	1 9	28	1 40	29	3	5 23	12	9	5 52	12	11	6 12	8	11	6 40	9	1	24.
16	2 13	29	2 45	30	6	6 21	13	3	6 48	13	7	7 8	9	3	7 36	9	6	25.
17	3 17	31	3 49	32	2	7 13	13	11	7 38	14	3	8 3	9	8	8 30	9	10	26.
18	4 20	33	4 50	34	2	8 3	14	7	8 27	15	0	8 57	10	1	9 24	10	3	27.
19	5 19	35	5 46	36	0	8 50	15	4	9 12	15	7	9 49	10	6	10 11	10	8	28.
20	6 13	36	6 39	37	3	9 35	15	11	9 58	16	2	10 33	10	10	10 55	11	0	●
21	7 5	37	7 30	38	3	10 21	16	4	10 43	16	5	11 18	11	2	11 42	11	2	0.
22	7 54	38	8 17	38	4	11 6	16	5	11 29	16	4	—	—	—	0 7	11	2	1.
23	8 40	38	9 3	37	10	11 54	16	3	—	—	—	0 32	11	1	0 57	11	0	2.
24	9 27	37	9 50	36	9	0 20	16	1	0 48	15	10	1 23	11	10	1 49	10	8	3.
25	10 12	35	10 33	35	0	1 17	15	6	1 45	15	2	2 16	10	6	2 44	10	4	4.
26	10 55	34	11 20	33	1	2 14	14	10	2 44	14	6	3 13	10	2	3 42	9	11	5.
27	11 46	32	—	—	—	3 15	14	1	3 48	13	10	4 14	9	9	4 47	9	7	D
28	0 13	31	0 44	30	11	4 21	13	8	4 57	13	6	5 18	9	5	5 49	9	4	7.
29	1 18	30	1 52	30	8	5 32	13	6	6 2	13	7	6 20	9	4	6 49	9	5	8.
30	2 25	30	3 0	31	0	6 31	13	8	7 0	13	9	7 18	9	6	7 48	9	7	9.
Half Mean Spring Range.				18ft. 7in.				8ft. 0in.				5ft. 6in.						

Half Mean Spring { 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

AD.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	2	24	Add.	9	1	1	Add.	17	0	39	Sub.	25	2	23	Sub.
2	2	15		10	0	49		18	0	52		26	2	35	
3	2	5		11	0	37		19	1	5		27	2	48	
4	1	55		12	0	25		20	1	18		28	3	0	
5	1	45		13	0	12		21	1	31		29	3	12	
6	1	34		14	0	0	Sub.	22	1	44		30	3	24	
7	1	23		15	0	13		23	1	57					
8	1	12		16	0	26		24	2	10					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

JUNE, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
M.	1	9a19	7	34	8	6	8	1	8	8	4	53	6	10	5	15	6	11	2	7	9	6	2	33	9	9
Tu.	2	10 7	8	27	8	10	8	52	9	0	5	38	7	0	6	2	7	2	2	58	9	11	3	22	10	10
W.	3	10 57	9	16	9	1	9	37	9	2	6	25	7	3	6	48	7	3	3	43	10	4	4	3	10	9
Th.	4	11 46	9	57	9	3	10	18	9	3	7	10	7	4	7	32	7	4	4	24	10	8	4	45	10	9
F.	5	morn.	10	38	9	3	10	57	9	3	7	52	7	4	8	11	7	5	5	6	10	9	5	26	10	10
S.	6	0 36	11	17	9	2	11	34	9	2	8	30	7	4	8	46	7	3	5	46	10	9	6	4	10	9
S.	7	1 26	11	50	9	1	—	—	—	—	9	2	7	1	9	18	7	0	6	21	10	5	6	38	10	9
M.	8	2 14	0	8	9	0	0	27	9	9	9	35	6	10	9	52	6	8	6	56	10	1	7	15	9	10
Tu.	9	3 2	0	47	8	11	1	7	8	10	10	9	6	6	10	28	6	5	7	33	9	7	7	52	9	10
W.	10	3 48	1	27	8	9	1	49	8	8	10	48	6	3	11	11	6	1	8	11	9	2	8	31	8	10
Th.	11	4 33	2	12	8	7	2	36	8	5	11	39	5	11	—	—	—	—	8	55	8	9	9	21	8	9
F.	12	5 17	3	0	8	4	3	24	8	3	0	8	5	9	0	39	5	7	9	48	8	5	10	19	8	8
S.	13	6 1	3	52	8	2	4	22	8	2	1	14	5	6	1	51	5	6	10	52	8	4	11	25	8	8
S.	14	6 44	4	54	8	1	5	25	8	1	2	28	5	7	3	2	5	8	11	57	8	5	—	—	—	—
M.	15	7 29	5	54	8	1	6	22	8	1	3	31	5	11	3	57	6	1	0	27	8	6	0	56	8	8
Tu.	16	8 16	6	52	8	2	7	22	8	3	4	22	6	4	4	45	6	6	1	25	8	9	1	54	9	9
W.	17	9 5	7	48	8	5	8	13	8	7	5	5	6	8	5	25	6	10	2	20	9	3	2	44	9	9
Th.	18	9 58	8	37	8	10	9	1	9	0	5	47	7	0	6	11	7	2	3	7	9	11	3	29	10	10
F.	19	10 55	9	25	9	2	9	48	9	4	6	35	7	4	7	0	7	6	3	51	10	6	4	14	10	10
S.	20	11 54	10	11	9	5	10	34	9	6	7	24	7	8	7	48	7	9	4	38	11	1	5	2	11	10
S.	21	0a56	10	57	9	7	11	21	9	7	8	11	7	11	8	34	8	0	5	27	11	6	5	51	11	10
M.	22	1 57	11	44	9	7	—	—	—	—	8	56	7	11	9	18	7	10	6	14	11	6	6	37	11	10
Tu.	23	2 57	0	8	9	7	0	33	9	6	9	41	7	8	10	4	7	6	7	2	11	3	7	27	11	10
W.	24	3 54	0	59	9	6	1	26	9	5	10	28	7	5	10	55	7	3	7	52	10	9	8	18	10	10
Th.	25	4 48	1	56	9	4	2	26	9	2	11	24	7	0	11	59	6	9	8	46	10	1	9	15	9	10
F.	26	5 39	2	56	9	0	3	26	8	10	—	—	—	—	0	36	6	5	9	48	9	7	10	23	9	9
S.	27	6 29	3	57	8	9	4	29	8	7	1	16	6	3	1	55	6	2	10	57	9	2	11	30	9	9
S.	28	7 17	4	59	8	6	5	30	8	5	2	33	6	2	3	7	6	2	—	—	—	—	0	3	9	9
M.	29	8 5	6	2	8	4	6	33	8	4	3	39	6	4	4	6	6	6	0	36	9	0	1	7	9	9
Tu.	30	8 54	7	4	8	4	7	34	8	4	4	30	6	7	4	54	6	7	1	37	9	1	2	7	9	9
Half Mean Spring } Range.			4ft. 9in.								3ft. 10in.								5ft. 7in.							

Phases of the Moon.												Moon's Declination at Noon.											
D. H. M.												M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full	-	-	-	-	5 6 55	Morning.						1	6	8. 4	9	16	8. 55	17	11	N. 34	25	8	5. 27
Last Quarter	-	-	-	-	13 10 14	Morning						2	10	2	10	14	38	18	14	57	26	4	1
New	-	-	-	-	20 2 45	Afternoon.						3	13	28	11	11	44	19	17	31	27	0	5. 31
First Quarter	-	-	-	-	27 5 51	Morning						4	16	12	12	8	21	20	19	2	28	4	56
												5	18	7	13	4	35	21	19	16	29	9	0
In Apogee	-	-	-	-	10 4 0	Morning						6	19	9	14	0	33	22	18	10	30	12	34
In Perigee	-	-	-	-	22 6 0	Morning.						7	19	16	15	3	N. 36	23	15	50			
												8	18	30	16	7	42	24	12	29			

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required, — BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

JUNE, 1868.

W. DAY.	M. DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.												
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.														
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.													
1	1	18	12	7	1	44	12	10	1	25	10	2	1	57	10	4	1	34	10	11	2	7	11	1	10.2	
2	2	10	13	1	2	37	13	4	2	26	10	6	2	54	10	8	2	38	11	4	3	10	11	6	11.2	
3	3	2	13	6	3	23	13	8	3	20	10	10	3	44	11	0	3	38	11	8	4	3	11	9	12.2	
4	4	3	44	13	10	4	5	13	11	4	6	11	2	4	28	11	3	4	27	11	10	4	5	11	11	13.2
5	5	4	25	14	0	4	44	14	1	4	49	11	3	5	10	11	3	5	12	11	11	5	32	11	11	○
6	6	5	4	14	0	5	24	13	11	5	31	11	3	5	51	11	2	5	51	11	11	6	10	11	10	15.2
7	7	5	42	13	10	5	59	13	8	6	8	11	1	6	26	11	0	6	28	11	9	6	46	11	8	16.2
8	8	6	17	13	5	6	36	13	2	6	44	10	10	7	2	10	8	7	5	11	7	7	23	11	6	17.2
9	9	6	55	12	11	7	14	12	8	7	20	10	6	7	38	10	4	7	40	11	5	7	57	11	3	18.2
10	10	7	34	12	5	7	55	12	1	7	56	10	2	8	14	10	0	8	15	11	2	8	33	11	0	19.2
11	11	8	18	11	9	8	41	11	6	8	33	9	10	8	54	9	8	8	51	10	10	9	10	10	8	20.2
12	12	9	4	11	2	9	31	11	0	9	15	9	6	9	38	9	4	9	30	10	6	9	55	10	4	21.2
13	13	10	1	10	10	10	33	10	10	10	4	9	3	10	33	9	2	10	24	10	2	10	55	10	0	☾
14	14	11	7	10	11	11	38	11	0	11	4	9	2	11	35	9	2	11	25	9	11	11	53	9	11	23.2
15	15	—	—	—	0	8	11	3	—	—	—	—	—	0	6	9	4	—	—	—	—	0	20	10	0	24.2
16	16	0	38	11	6	1	7	11	10	0	37	9	6	1	9	9	8	0	48	10	3	1	18	10	5	25.2
17	17	1	32	12	3	1	56	12	8	1	40	9	11	2	9	10	2	1	48	10	8	2	19	11	0	26.2
18	18	2	21	13	1	2	46	13	5	2	37	10	6	3	4	10	9	2	50	11	3	3	19	11	7	27.2
19	19	3	10	13	10	3	34	14	2	3	30	11	1	3	55	11	4	3	47	11	10	4	15	12	1	28.2
20	20	3	58	14	6	4	22	14	10	4	20	11	7	4	45	11	10	4	43	12	4	5	8	12	5	●
21	21	4	45	15	1	5	9	15	3	5	10	12	0	5	36	12	1	5	32	12	7	5	57	12	9	0.9
22	22	5	34	15	4	5	58	15	3	6	1	12	1	6	25	12	1	6	22	12	9	6	46	12	9	1.9
23	23	6	23	15	1	6	48	14	11	6	49	12	0	7	14	11	10	7	11	12	9	7	35	12	8	2.9
24	24	7	14	14	8	7	42	14	4	7	39	11	8	8	4	11	5	7	59	12	7	8	24	12	5	3.9
25	25	8	10	13	11	8	38	13	5	8	29	11	2	8	54	10	11	8	48	12	2	9	11	11	11	4.9
26	26	9	7	12	11	9	37	12	6	9	19	10	8	9	45	10	5	9	34	11	8	10	1	11	4	5.9
27	27	10	8	12	2	10	39	12	0	10	11	10	2	10	38	9	11	10	30	11	1	11	0	10	10	☾
28	28	11	12	11	11	11	48	11	10	11	10	9	10	11	44	9	9	11	30	10	7	—	—	—	—	7.9
29	29	—	—	—	0	19	11	10	—	—	—	—	—	0	17	9	9	0	1	10	5	0	30	10	6	8.9
30	30	0	49	11	11	1	18	12	1	0	49	9	9	1	23	9	10	1	0	10	6	1	32	10	7	9.9
Half Mean Spring Range.		7ft. 5in.				5ft 10in.				6ft. 2in.																

Half Mean Spring } 7ft. 5in.
Range.

5ft 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	2	24	Add.	9	1	1	Add.	17	0	39	Sub.	25	2	23	Sub.
2	2	15		10	0	49		18	0	52		26	2	35	
3	2	5		11	0	37		19	1	5		27	3	48	
4	1	55		12	0	25		20	1	18		28	3	0	
5	1	45		13	0	12		21	1	31		29	3	12	
6	1	34		14	0	0	Sub.	22	1	44		30	3	24	
7	1	23		15	0	13		23	1	57					
8	1	12		16	0	26		24	2	10					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

JULY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.				
		H. M.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.
W.	1	9 42	0	54	15	6	1	25	15	10	2	36	13	4	3	7	13	7	8	45	11	1	9	17	11	
Th.	2	10 31	1	50	16	2	2	13	16	6	3	36	13	10	4	2	14	1	9	44	11	5	10	9	11	
F.	3	11 21	2	35	16	9	2	56	17	1	4	26	14	2	4	48	14	6	10	31	11	7	10	52	11	
S.	4	morn.	3	17	17	4	3	37	17	6	5	10	14	5	5	31	14	10	11	13	11	9	11	33	11	18
S.	5	0 10	3	57	17	6	4	17	17	6	5	50	14	6	6	9	15	0	11	53	11	11	—	—	—	—
M.	6	0 58	4	34	17	6	4	50	17	6	6	27	14	6	6	44	15	0	0	13	11	10	0	31	11	10
Tu.	7	1 44	5	6	17	4	5	23	17	3	6	59	14	4	7	13	14	10	0	49	11	10	1	6	11	
W.	8	2 30	5	39	17	2	5	56	17	0	7	28	14	1	7	44	14	6	1	23	11	9	1	40	11	
Th.	9	3 14	6	14	16	10	6	33	16	7	8	1	13	8	8	17	14	0	1	57	11	7	2	15	11	
F.	10	3 57	6	51	16	3	7	11	15	11	8	33	13	2	8	48	13	6	2	33	11	5	2	52	11	4
S.	11	4 40	7	32	15	6	7	54	15	2	9	5	12	9	9	25	13	0	3	12	11	2	3	32	11	1
S.	12	5 24	8	16	14	10	8	41	14	6	9	46	12	4	10	9	12	7	3	52	10	11	4	13	10	9
M.	13	6 9	9	8	14	4	9	37	14	2	10	35	12	1	11	2	12	3	4	38	10	7	5	4	10	5
Tu.	14	6 55	10	11	14	3	10	45	14	4	11	34	12	1	—	—	—	—	5	31	10	4	6	3	10	3
W.	15	7 45	11	19	14	7	11	56	14	11	0	12	12	4	0	51	12	6	6	34	10	3	7	7	10	3
Th.	16	8 39	—	—	—	—	0	28	15	5	1	29	12	9	2	7	13	0	7	43	10	8	8	17	11	8
F.	17	9 36	1	0	16	0	1	31	16	7	2	42	13	4	3	16	13	11	8	51	11	4	9	23	11	8
S.	18	10 36	1	58	17	4	2	24	18	1	3	46	14	3	4	14	14	10	9	52	12	0	10	20	12	8
S.	19	11 38	2	50	18	10	3	16	19	5	4	42	15	0	5	9	15	8	10	46	12	6	11	12	12	8
M.	20	0 40	3	42	19	9	4	8	20	0	5	35	15	7	6	2	16	3	11	38	13	0	—	—	—	—
Tu.	21	1 40	4	32	20	3	4	55	20	4	6	28	15	11	6	52	16	7	0	4	13	2	0	29	13	1
W.	22	2 38	5	18	20	3	5	41	20	1	7	15	16	0	7	38	16	6	0	54	13	2	1	18	13	1
Th.	23	3 32	6	5	19	9	6	30	19	4	8	1	15	9	8	24	16	1	1	42	13	1	2	6	13	0
F.	24	4 24	6	54	18	9	7	18	18	2	8	47	15	2	9	9	15	4	2	31	12	10	2	55	12	0
S.	25	5 14	7	43	17	5	8	8	16	8	9	30	14	6	9	52	14	6	3	19	12	4	3	43	12	0
S.	26	6 3	8	34	16	0	9	1	15	4	10	14	13	8	10	38	13	7	4	7	11	8	4	31	11	0
M.	27	6 51	9	29	14	10	10	1	14	6	11	5	12	11	11	33	12	8	4	57	11	0	5	24	10	0
Tu.	28	7 40	10	37	14	3	11	14	14	1	—	—	—	—	0	6	12	6	5	54	10	5	6	27	10	0
W.	29	8 29	11	51	14	1	—	—	—	—	0	43	12	5	1	20	12	6	7	2	10	2	7	38	10	0
Th.	30	9 18	0	28	14	3	1	0	14	7	1	56	12	6	2	31	12	9	8	17	10	5	8	51	10	0
F.	31	10 6	1	31	14	11	1	56	15	5	3	3	12	11	3	34	13	6	9	23	10	10	9	50	11	0
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							

Phases of the Moon.					Moon's Declination at Noon.											
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	4	8	39	Afternoon.	1	15	S. 30	9	9	S. 32	17	18	N. 28	25	3	S. 5
Last Quarter -	13	0	40	Morning.	2	17	39	10	5	54	18	19	18	26	7	5
New - - - - -	19	9	56	Afternoon.	3	18	57	11	2	0	19	18	49	27	11	3
First Quarter -	26	1	52	Afternoon.	4	19	21	12	2	N. 3	20	16	59	28	14	4
					5	18	52	13	6	7	21	13	58	29	17	
In Apogee - -	7	5	0	Afternoon.	6	17	33	14	10	1	22	10	3	30	18	3
In Perigee - -	20	1	0	Afternoon.	7	15	28	15	13	33	23	5	36	31	19	1
					8	12	46	16	16	27	24	0	56			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

JULY, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
W.	1	8 10	16 0	8 41	16 3	9 59	14 3	10 30	14 5	11 26	16 9	11 58	16 10	10 9
Th.	2	9 7	16 6	9 32	16 8	10 59	14 7	11 24	14 9	—	—	0 26	17 0	11 9
F.	3	9 55	16 10	10 18	17 0	11 47	14 10	—	—	0 51	17 2	1 15	17 4	12 9
S.	4	10 41	17 2	11 2	17 3	0 8	14 11	0 29	15 1	1 39	17 6	2 1	17 9	0
S.	5	11 24	17 4	11 45	17 4	0 50	15 2	1 10	15 3	2 21	17 11	2 40	18 0	14 9
M.	6	—	—	0 4	17 5	1 29	15 3	1 48	15 3	2 58	18 1	3 16	18 2	15 9
Tu.	7	0 23	17 5	0 41	17 4	2 5	15 3	2 21	15 2	3 35	18 3	3 53	18 3	16 9
W.	8	0 59	17 4	1 18	17 3	2 37	15 1	2 53	15 0	4 9	18 2	4 25	18 1	17 9
Th.	9	1 37	17 2	1 55	17 1	3 9	14 11	3 26	14 10	4 42	18 0	4 58	17 11	18 9
F.	10	2 14	16 11	2 33	16 8	3 44	14 8	4 3	14 6	5 16	17 10	5 35	17 8	19 9
S.	11	2 53	16 5	3 13	16 2	4 22	14 4	4 42	14 2	5 53	17 6	6 14	17 4	20 9
S.	12	3 33	15 11	3 55	15 8	5 2	14 0	5 24	13 10	6 35	17 1	6 56	16 11	21 9
M.	13	4 18	15 5	4 42	15 1	5 48	13 8	6 15	13 6	7 20	16 8	7 45	16 6	22 9
Tu.	14	5 7	14 11	5 35	14 10	6 46	13 4	7 18	13 3	8 14	16 4	8 47	16 3	23 9
W.	15	6 4	14 10	6 34	15 1	7 53	13 4	8 26	13 5	9 22	16 3	9 55	16 2	24 9
Th.	16	7 9	15 6	7 43	15 11	8 59	13 8	9 33	14 0	10 26	16 4	10 58	16 7	25 9
F.	17	8 16	16 5	8 46	16 11	10 5	14 4	10 36	14 8	11 32	16 10	—	—	26 9
S.	18	9 15	17 5	9 44	17 11	11 5	15 0	11 31	15 4	0 4	17 2	0 33	17 6	27 9
S.	19	10 12	18 5	10 40	18 10	11 57	15 9	—	—	1 0	17 11	1 27	18 4	28 9
M.	20	11 8	19 2	11 37	19 5	0 23	16 1	0 49	16 4	1 54	18 9	2 18	19 2	0 6
Tu.	21	—	—	0 3	19 7	1 15	16 7	1 40	16 9	2 44	19 6	3 10	19 9	1 6
W.	22	0 28	19 8	0 53	19 8	2 4	16 9	2 27	16 9	3 35	19 11	3 58	20 0	2 6
Th.	23	1 19	19 7	1 45	19 4	2 49	16 8	3 11	16 7	4 20	19 11	4 43	19 10	3 6
F.	24	2 11	19 1	2 36	18 9	3 35	16 4	4 0	16 1	5 7	19 8	5 32	19 5	4 6
S.	25	3 0	18 3	3 24	17 9	4 24	15 10	4 48	15 5	5 56	19 1	6 20	18 9	5 6
S.	26	3 48	17 2	4 12	16 7	5 13	15 0	5 40	14 8	6 44	18 3	7 10	17 10	6 6
M.	27	4 36	16 0	5 1	15 5	6 8	14 3	6 36	13 11	7 36	17 5	8 4	17 0	7 6
Tu.	28	5 28	15 1	5 57	14 9	7 8	13 7	7 42	13 5	8 36	16 8	9 12	16 5	8 6
W.	29	6 29	14 8	7 4	14 9	8 19	13 4	8 54	13 5	9 46	16 2	10 20	16 1	9 6
Th.	30	7 43	15 0	8 15	15 3	9 30	13 6	10 5	13 8	10 56	16 1	11 32	16 1	10 6
F.	31	8 46	15 6	9 13	15 10	10 36	13 10	11 5	14 1	—	—	0 5	16 3	11 6
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	35	Sub.	9	4	56	Sub.	17	5	52	Sub.	25	6	14	Sub.
2	3	47		10	5	5		18	5	56		26	6	14	
3	3	58		11	5	13		19	6	0		27	6	13	
4	4	8		12	5	20		20	6	4		28	6	12	
5	4	19		13	5	28		21	6	7		29	6	11	
6	4	29		14	5	34		22	6	10		30	6	8	
7	4	38		15	5	41		23	6	12		31	6	5	
8	4	47		16	5	46		24	6	13					

The times of High-Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.
D 2

TIDE TABLES FOR THE

JULY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.											
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.								
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.							
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.								
W.	1	9 42	9	7	10	5	9	38	10	7	3	28	18	1	3	59	18	4	0	20	12	1	0	49	12	3
Th.	2	10 31	10	9	10	8	10	35	10	9	4	29	18	7	4	53	18	10	1	19	12	6	1	45	12	8
F.	3	11 21	10	58	10	10	11	20	10	11	5	15	19	0	5	36	19	1	2	9	12	9	2	32	12	11
S.	4	morn.	11	42	11	0	—	—	—	—	5	58	19	3	6	20	19	4	2	54	13	1	3	15	13	2
♄.	5	0 10	0	3	11	1	0	23	11	1	6	41	19	5	7	1	19	6	3	34	13	3	3	53	13	4
M.	6	0 58	0	42	11	1	1	1	11	0	7	20	19	6	7	38	19	6	4	11	13	5	4	28	13	6
Tu.	7	1 44	1	19	11	0	1	36	10	11	7	55	19	6	8	11	19	5	4	44	13	5	5	1	13	4
W.	8	2 30	1	52	10	10	2	9	10	9	8	27	19	4	8	44	19	2	5	17	13	2	5	34	13	0
Th.	9	3 14	2	26	10	8	2	44	10	7	9	2	19	0	9	20	18	9	5	52	12	10	6	11	12	8
F.	10	3 57	3	2	10	6	3	21	10	5	9	38	18	6	9	57	18	3	6	30	12	6	6	51	12	4
S.	11	4 40	3	39	10	4	3	58	10	3	10	17	18	0	10	38	17	9	7	13	12	2	7	34	12	0
♄.	12	5 24	4	18	10	2	4	39	10	1	11	2	17	6	11	28	17	3	7	56	11	10	8	20	11	8
M.	13	6 9	5	1	10	0	5	27	9	11	11	59	17	0	—	—	—	8	47	11	6	9	17	11	4	0
Tu.	14	6 55	5	54	9	10	6	23	9	10	0	31	16	9	1	2	16	8	9	49	11	3	10	22	11	3
W.	15	7 45	7	0	9	11	7	34	10	0	1	33	16	8	2	2	16	10	10	53	11	4	11	24	11	6
Th.	16	8 39	8	7	10	1	8	40	10	3	2	31	17	2	3	4	17	8	11	54	11	10	—	—	—	—
F.	17	9 36	9	12	10	6	9	43	10	9	3	33	18	3	4	5	18	9	0	24	12	2	0	55	12	7
S.	18	10 36	10	14	11	0	10	42	11	2	4	34	19	3	5	0	19	10	1	24	13	0	1	53	13	4
♄.	19	11 38	11	9	11	5	11	36	11	8	5	26	20	4	5	52	20	9	2	21	13	9	2	48	14	1
M.	20	0 40	—	—	—	—	0	2	11	10	6	19	20	1	6	45	21	5	3	13	14	5	3	38	14	9
Tu.	21	1 40	0	27	11	11	0	52	12	0	7	11	21	9	7	36	21	11	4	3	15	0	4	26	15	2
W.	22	2 38	1	17	12	0	1	41	11	11	8	0	21	11	8	23	21	11	4	49	15	2	5	12	15	1
Th.	23	3 32	2	4	11	10	2	28	11	9	8	46	21	9	9	11	21	5	5	36	14	11	6	1	14	7
F.	24	4 24	2	53	11	7	3	18	11	5	9	36	20	11	10	0	20	6	6	27	14	3	6	53	13	11
S.	25	5 14	3	42	11	3	4	5	11	1	10	23	19	11	10	49	19	5	7	19	13	7	7	45	13	2
♄.	26	6 3	4	29	10	10	4	54	10	7	11	18	18	9	11	49	18	3	8	12	12	9	8	40	12	4
M.	27	6 51	5	20	10	5	5	47	10	3	—	—	—	—	0	21	17	8	9	9	12	0	9	39	11	8
Tu.	28	7 40	6	15	10	1	6	49	10	0	0	53	17	3	1	24	16	11	10	12	11	5	10	46	11	3
W.	29	8 29	7	27	9	11	8	2	9	11	1	55	16	9	2	27	16	9	11	20	11	3	11	53	11	4
Th.	30	9 18	8	37	10	0	9	11	10	1	2	59	16	11	3	32	17	2	—	—	—	—	0	25	11	6
F.	31	10 6	9	43	10	2	10	14	10	4	4	4	17	6	4	34	17	10	0	55	11	8	1	24	11	11
Half Mean Spring } Range.			5 ft. 9 in.						10 ft. 5 in.						7 ft. 2 in.											
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
Full - - - - - 4 8 39 Afternoon.												1 15 8.30 9 9 8.32 17 18 N. 28 25 3 5.58														
Last Quarter - 13 0 40 Morning.												2 17 39 10 5 54 18 19 18 26 7 54														
New - - - - - 19 9 56 Afternoon.												3 18 57 11 2 0 19 18 49 27 11 39														
First Quarter - 26 1 52 Afternoon.												4 19 21 12 2 N. 3 20 16 59 28 14 45														
In Apogee - - 7 5 0 Afternoon.												5 18 52 13 6 7 21 13 58 29 17 7														
In Perigee - - 20 1 0 Afternoon.												6 17 33 14 10 1 22 10 3 30 18 38														
												7 15 28 15 13 33 23 5 36 31 19 17														
												8 12 46 16 16 27 24 0 56														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

JULY, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
W.	1	0	33	11	1	1	1	11	2	11	55	13	10	—	—	5	57	10	6	6	23	10	9	10	9	10.9
Th.	2	1	28	11	3	1	52	11	5	0	23	14	0	0	47	14	3	6	46	11	1	7	6	11	4	11.9
F.	3	2	14	11	7	2	35	11	9	1	9	14	6	1	31	14	9	7	25	11	7	7	43	11	11	12.9
S.	4	2	55	11	11	3	15	12	1	1	52	14	11	2	13	15	1	8	2	12	1	8	20	12	3	○
S.	5	3	34	12	2	3	53	12	3	2	32	15	3	2	51	15	3	8	38	12	3	8	56	12	2	14.9
M.	6	4	12	12	3	4	29	12	3	3	8	15	3	3	25	15	2	9	13	12	2	9	31	12	1	15.9
Tu.	7	4	46	12	2	5	4	12	0	3	42	15	1	3	58	14	11	9	48	12	0	10	5	11	10	16.9
W.	8	5	21	11	11	5	39	11	10	4	15	14	10	4	33	14	9	10	23	11	8	10	41	11	6	17.9
Th.	9	5	57	11	8	6	15	11	7	4	51	14	7	5	9	14	6	11	0	11	4	11	20	11	2	18.9
F.	10	6	34	11	6	6	53	11	4	5	28	14	4	5	49	14	2	11	41	10	11	—	—	—	—	19.9
S.	11	7	14	11	2	7	36	10	11	6	11	13	11	6	33	13	8	0	2	10	9	0	24	10	6	20.9
S.	12	8	0	10	8	8	26	10	5	6	55	13	6	7	20	13	3	0	47	10	4	1	12	10	2	21.9
M.	13	8	55	10	3	9	27	10	2	7	50	13	1	8	21	12	11	1	40	10	0	2	12	9	11	☾
Tu.	14	10	1	10	2	10	35	10	3	8	53	12	10	9	28	12	10	2	45	9	10	3	22	9	9	23.9
W.	15	11	6	10	4	11	37	10	7	10	0	13	0	10	31	13	2	3	57	9	10	4	30	10	0	24.9
Th.	16	—	—	—	—	0	9	10	10	11	2	13	5	11	32	13	9	5	4	10	2	5	34	10	5	25.9
F.	17	0	38	11	2	1	7	11	5	—	—	—	—	0	1	14	2	6	3	10	10	6	29	11	4	26.9
S.	18	1	34	11	9	2	0	12	2	0	28	14	7	0	54	15	1	6	52	11	11	7	15	12	6	27.9
S.	19	2	25	12	7	2	49	13	0	1	20	15	7	1	46	16	1	7	37	13	1	8	0	13	6	●
M.	20	3	13	13	4	3	38	13	8	2	11	16	6	2	36	16	10	8	24	13	10	8	48	14	0	0.6
T.	21	4	3	13	10	4	27	14	0	3	0	17	0	3	24	17	1	9	12	14	1	9	36	14	0	1.6
W.	22	4	51	13	11	5	15	13	9	3	47	17	0	4	10	16	11	10	0	13	11	10	25	13	9	2.6
Th.	23	5	39	13	7	6	4	13	5	4	34	16	9	4	59	16	6	10	50	13	5	11	16	13	1	3.6
F.	24	6	31	13	2	6	56	12	10	5	25	16	3	5	51	15	11	11	43	12	8	—	—	—	—	4.6
S.	25	7	21	12	6	7	47	12	1	6	17	15	6	6	44	15	0	0	9	12	3	0	35	11	10	5.6
S.	26	8	16	11	7	8	46	11	2	7	12	14	6	7	41	14	1	1	3	11	4	1	32	10	11	☾
M.	27	9	18	10	9	9	51	10	6	8	11	13	8	8	43	13	3	2	2	10	7	2	35	10	3	7.6
Tu.	28	10	25	10	4	10	58	10	3	9	17	13	1	9	52	12	11	3	11	10	0	3	50	9	9	8.6
W.	29	11	32	10	3	—	—	—	—	10	26	12	10	10	59	12	11	4	25	9	8	5	0	9	7	9.6
Th.	30	0	6	10	4	0	39	10	5	11	32	13	0	—	—	—	—	5	34	9	8	6	4	9	10	10.6
F.	31	1	8	10	7	1	35	10	9	0	2	13	2	0	29	13	5	6	31	10	2	6	53	10	7	11.6

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	35	Sub.	9	4	56	Sub.	17	5	52	Sub.	25	6	14	Sub.
2	3	47		10	5	5		18	5	56		26	6	14	
3	3	58		11	5	13		19	6	0		27	6	13	
4	4	8		12	5	20		20	6	4		28	6	12	
5	4	19		13	5	28		21	6	7		29	6	11	
6	4	29		14	5	34		22	6	10		30	6	8	
7	4	38		15	5	41		23	6	12		31	6	5	
8	4	47		16	5	46		24	6	13					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

JULY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	9 42	9 7	8 9	9 38	8 10	8 33	22 4	9 23	22 9	3 2	17 4	3 34	17 9
Th.	2	10 31	10 5	8 11	10 29	11 11	9 26	23 0	9 48	23 3	4 3	18 1	4 29	18 4
F.	3	11 21	10 52	9 0	11 15	9 0	10 9	23 6	10 30	23 12	4 55	18 7	5 20	18 11
S.	4	morn.	11 38	9 1	12 0	9 1	10 52	23 11	11 12	24 0	5 43	19 1	6 4	19 3
S.	5	0 10	—	—	0 21	9 2	11 33	24 2	11 52	24 2	6 24	19 4	6 43	19 3
M.	6	0 58	0 40	9 2	0 58	9 1	—	—	0 9	24 3	7 0	19 5	7 17	19 3
Tu.	7	1 44	1 16	9 3	1 33	9 3	0 26	24 3	0 44	24 2	7 33	19 3	7 49	19 2
W.	8	2 30	1 49	9 3	2 6	9 1	1 0	24 0	1 16	23 10	8 6	19 0	8 24	18 10
Th.	9	3 14	2 23	9 2	2 41	9 2	1 33	23 6	1 51	23 3	8 42	18 8	9 0	18 4
F.	10	3 57	2 59	9 1	3 17	9 0	2 9	23 0	2 27	22 8	9 18	18 3	9 37	17 11
S.	11	4 40	3 35	9 0	3 55	8 11	2 46	22 5	3 6	22 1	9 55	17 7	10 14	17 4
S.	12	5 24	4 16	8 10	4 38	8 9	3 27	21 9	3 49	21 3	10 34	17 0	10 55	16 1
M.	13	6 9	5 2	8 8	5 29	8 7	4 15	21 0	4 45	20 8	11 18	16 3	11 43	16 1
Tu.	14	6 55	5 57	8 6	6 29	8 5	5 17	20 6	5 53	20 7	—	—	0 12	16 4
W.	15	7 45	7 0	8 4	7 32	8 5	6 28	20 9	7 3	21 2	0 42	16 1	1 16	16 3
Th.	16	8 39	8 7	8 7	8 40	8 9	7 37	21 8	8 9	22 3	1 56	16 8	2 33	17 2
F.	17	9 36	9 13	8 11	9 44	9 1	8 39	22 11	9 7	23 7	3 8	17 10	3 41	18 4
S.	18	10 36	10 13	9 3	10 41	10 5	9 33	24 4	9 59	25 0	4 12	19 3	4 43	19 11
S.	19	11 38	11 9	9 7	11 37	9 8	10 25	25 8	10 51	26 2	5 13	20 7	5 42	21 4
M.	20	on 40	—	—	0 4	9 10	11 16	26 7	11 42	27 0	6 8	21 6	6 34	21 10
Tu.	21	1 40	0 31	10 0	0 56	10 1	—	—	0 7	27 4	6 59	22 2	7 22	22 3
W.	22	2 38	1 21	10 2	1 44	10 2	0 31	27 5	0 55	27 4	7 45	22 2	8 9	22 6
Th.	23	3 32	2 7	10 1	2 31	10 0	1 18	27 2	1 42	26 8	8 33	21 8	8 58	21 1
F.	24	4 24	2 55	9 11	3 19	9 1	2 6	26 1	2 30	25 6	9 22	20 9	9 44	20 1
S.	25	5 14	3 42	9 8	4 6	9 6	2 53	24 10	3 17	24 2	10 6	19 6	10 28	18 11
S.	26	6 3	4 30	9 3	4 56	9 1	3 42	23 4	4 8	22 7	10 51	18 2	11 13	17 1
M.	27	6 51	5 22	8 11	5 49	8 8	4 36	21 11	5 7	21 3	11 37	16 9	—	—
Tu.	28	7 40	6 20	8 6	6 53	8 4	5 42	20 11	6 20	20 8	0 4	16 4	0 34	16 1
W.	29	8 29	7 28	8 3	8 3	8 4	6 58	20 7	7 34	20 8	1 10	15 10	1 51	15 11
Th.	30	9 18	8 39	8 5	9 12	8 6	8 9	20 11	8 39	21 4	2 31	16 0	3 6	16 4
F.	31	10 6	9 44	8 7	10 11	8 8	9 8	21 9	9 32	22 2	3 40	16 10	4 9	17 4

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.
Full - - - - -	4	8	39 Afternoon.
Last Quarter -	13	0	40 Morning.
New - - - - -	19	9	56 Afternoon.
First Quarter	26	1	52 Afternoon.

In Apogee - - 7 5 0 Afternoon.
In Perigee - - 20 1 0 Afternoon.

Moon's Declination at Noon.

D.	°	'	N.	D.	°	'	S.
7	18	28	25	35	25	35	25
8	19	18	26	7	24	24	24
9	18	49	27	11	23	23	23
0	16	59	28	14	22	22	22
1	13	58	29	17	21	21	21
2	10	3	30	18	20	20	20
3	5	36	31	19	17	17	17
4	0	56	—	—	—	—	—

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

JULY, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D.
W.	1	3 36 31 3		4 12 31 10		7 29 13 11		7 57 14 1		8 19 9 8		8 50 9 9		10.9
Th.	2	4 42 32 4		5 10 32 10		8 22 14 3		8 44 14 4		9 18 9 10		9 43 9 11		11.9
F.	3	5 36 33 3		6 0 33 9		9 4 14 6		9 25 14 9		10 4 10 0		10 24 10 2		12.9
S.	4	6 24 34 1		6 46 34 3		9 46 14 9		10 5 14 10		10 44 10 3		11 3 10 4		○
S.	5	7 7 34 5		7 27 34 7		10 24 14 11		10 41 14 11		11 21 10 5		11 39 10 3		14.9
M.	6	7 44 34 9		8 0 34 9		10 56 14 11		11 12 14 10		11 57 10 4		— —		15.9
Tu.	7	8 16 34 7		8 32 34 6		11 29 14 9		11 46 14 9		0 15 10 4		0 32 10 3		16.9
W.	8	8 48 34 4		9 4 34 2		— —		0 4 14 7		0 49 10 2		1 7 10 1		17.9
Th.	9	9 21 33 11		9 37 33 9		0 23 14 6		0 42 14 4		1 26 10 0		1 44 9 10		18.9
F.	10	9 53 33 1		10 9 32 8		1 2 14 2		1 23 14 0		2 3 9 9		2 23 9 8		19.9
S.	11	10 25 32 1		10 42 31 7		1 44 13 9		2 6 13 7		2 44 9 7		3 5 9 6		20.9
S.	12	11 1 30 11		11 23 30 5		2 28 13 5		2 53 13 2		3 27 9 4		3 51 9 3		21.9
M.	13	11 49 29 11		— —		3 21 13 0		3 53 12 11		4 20 9 2		4 50 9 1		○
Tu.	14	0 17 29 7		0 48 29 5		4 26 12 10		5 1 12 11		5 21 9 0		5 53 9 0		23.9
W.	15	1 20 29 7		1 53 29 11		5 33 13 1		6 4 13 3		6 23 9 1		6 52 9 3		24.9
Th.	16	2 29 30 6		3 4 31 3		6 35 13 6		7 5 13 10		7 23 9 5		7 54 9 8		25.9
F.	17	3 42 32 1		4 19 33 1		7 35 14 3		8 3 14 7		8 25 9 10		8 56 10 1		26.9
S.	18	4 52 34 3		5 24 35 5		8 29 15 0		8 54 15 5		9 26 10 4		9 54 10 6		27.9
S.	19	5 54 36 6		6 23 37 4		9 19 15 10		9 44 16 2		10 18 10 9		10 42 11 0		●
M.	20	6 51 38 0		7 18 38 8		10 9 16 5		10 33 16 8		11 6 11 2		11 31 11 4		0.6
Tu.	21	7 42 39 2		8 5 39 3		10 55 16 10		11 17 16 10		11 55 11 4		— —		1.6
W.	22	8 28 39 3		8 50 39 1		11 40 16 9		— —		0 20 11 4		0 44 11 3		2.6
Th.	23	9 13 38 7		9 35 38 0		0 0 5 16 7		0 31 16 4		1 9 11 2		1 34 11 0		3.6
F.	24	9 57 37 2		10 17 36 3		0 58 16 1		1 25 15 8		2 0 10 10		2 25 10 7		4.6
S.	25	10 36 35 2		10 56 34 0		1 51 15 4		2 17 14 11		2 50 10 5		3 16 10 2		5.6
S.	26	11 19 32 10		11 42 31 8		2 44 14 5		3 13 14 0		3 43 9 11		4 11 9 8		○
M.	27	— —		0 9 30 8		3 43 13 7		4 16 13 3		4 41 9 5		5 13 9 3		7.6
Tu.	28	0 40 29 11		1 13 29 5		4 51 13 1		5 26 12 11		5 44 9 1		6 15 9 0		8.6
W.	29	1 49 29 2		2 26 29 2		6 0 12 11		6 33 13 0		6 47 9 1		7 20 9 2		9.6
Th.	30	3 4 29 5		3 41 29 10		7 5 13 1		7 35 13 3		7 53 9 3		8 25 9 4		10.6
F.	31	4 17 30 5		4 47 31 1		8 4 13 6		8 28 13 9		8 56 9 5		9 24 9 7		11.6
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 35		9	4 56		17	5 52		25	6 14	
2	3 47		10	5 5		18	5 56		26	6 14	
3	3 58		11	5 13		19	6 0		27	6 13	
4	4 8		12	5 20		20	6 4		28	6 12	
5	4 19		13	5 28		21	6 7		29	6 11	
6	4 29		14	5 34		22	6 10		30	6 8	
7	4 38		15	5 41		23	6 12		31	6 5	
8	4 47		16	5 46		24	6 13				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JULY, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.					
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.		
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.	
		H. M.	H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.	
W.	1	9a42	8 4	8 5		8 32	8 7		5 19	6 8		5 43	6 9		2 36	9 4		3 3	9 6	
Th.	2	10 31	8 56	8 9		9 19	8 10		6 6	6 10		6 29	6 10		3 26	9 8		3 46	9 13	
F.	3	11 21	9 40	8 11		10 1	9 0		6 51	6 11		7 13	7 0		4 6	10 0		4 27	10 2	
S.	4	morn.	10 22	9 0		10 41	9 1		7 35	7 0		7 55	7 1		4 49	10 3		5 10	10 4	
♄.	5	0 10	11 0	9 1		11 18	9 1		8 14	7 2		8 31	7 2		5 30	10 5		5 48	10 6	
M.	6	0 58	11 34	9 0		11 50	9 0		8 47	7 2		9 2	7 1		6 4	10 6		6 20	10 5	
Tu.	7	1 44	—	—		0 7	9 0		9 18	6 11		9 33	6 10		6 37	10 3		6 54	10 2	
W.	8	2 30	0 25	9 0		0 43	8 11		9 49	6 9		10 5	6 8		7 12	10 0		7 29	9 13	
Th.	9	3 14	1 2	8 11		1 21	8 10		10 23	6 7		10 42	6 6		7 47	9 8		8 5	9 6	
F.	10	3 57	1 41	8 10		2 3	8 9		11 2	6 4		11 25	6 3		8 24	9 3		8 45	9 1	
S.	11	4 40	2 25	8 8		2 48	8 7		11 51	6 1		—	—		9 8	9 0		9 33	8 10	
♄.	12	5 24	3 11	8 5		3 35	8 4		0 19	5 11		0 50	5 9		9 59	8 8		10 30	8 7	
M.	13	6 9	4 2	8 3		4 32	8 3		1 24	5 8		2 1	5 8		11 2	8 6		11 34	8 6	
Tu.	14	6 55	5 3	8 3		5 35	8 2		2 38	5 9		3 12	5 11		—	—		0 8	8 7	
W.	15	7 45	6 4	8 2		6 35	8 2		3 41	6 1		4 8	6 3		0 38	8 8		1 9	8 13	
Th.	16	8 39	7 9	8 3		7 39	8 5		4 34	6 6		4 59	6 8		1 41	9 0		2 12	9 1	
F.	17	9 36	8 9	8 7		8 37	8 10		5 23	6 10		5 48	7 0		2 41	9 7		3 8	9 11	
S.	18	10 36	9 3	9 0		9 29	9 3		6 14	7 3		6 40	7 5		3 32	10 3		3 56	10 7	
♄.	19	11 38	9 55	9 5		10 20	9 7		7 7	7 7		7 34	7 9		4 21	11 0		4 47	11 2	
M.	20	0a40	10 45	9 8		11 10	9 8		7 59	7 11		8 23	8 1		5 13	11 7		5 39	11 9	
Tu.	21	1 40	11 33	9 9		11 55	9 9		8 46	8 2		9 7	8 1		6 3	11 10		6 26	11 9	
W.	22	2 38	—	—		0 09	9 9		9 29	8 0		9 51	7 10		6 49	11 8		7 13	11 6	
Th.	23	3 32	0 44	9 8		1 10	9 7		10 14	7 8		10 38	7 6		7 38	11 2		8 2	10 10	
F.	24	4 24	1 37	9 6		2 4	9 4		11 3	7 4		11 31	7 1		8 26	10 7		8 51	10 3	
S.	25	5 14	2 31	9 2		2 59	9 0		—	—		0 2	6 9		9 19	9 11		9 49	9 7	
♄.	26	6 3	3 27	8 10		3 55	8 8		0 36	6 5		1 12	6 2		10 20	9 3		10 52	9 6	
M.	27	6 51	4 24	8 6		4 54	8 4		1 49	6 1		2 28	5 11		11 25	8 10		11 58	8 9	
Tu.	28	7 40	5 25	8 3		5 57	8 2		3 2	5 11		3 34	6 0		—	—		0 31	8 7	
W.	29	8 29	6 30	8 1		7 5	8 1		4 4	6 1		4 33	6 2		1 4	8 7		1 38	8 7	
Th.	30	9 18	7 40	8 1		8 10	8 2		5 1	6 3		5 26	6 4		2 12	8 8		2 42	8 10	
F.	31	10 6	8 38	8 4		9 2	8 6		5 50	6 5		6 13	6 6		3 9	9 1		3 32	9 3	

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Full - - - - -	4	8	39	Afternoon.	1	15	30		9	9	32		17	18	N.28		25	3	38
Last Quarter -	13	0	40	Morning.	2	17	39		10	5	54		18	19	18		26	7	54
New - - - - -	19	9	56	Afternoon.	3	18	57		11	2	0		19	18	49		27	11	39
First Quarter	26	1	52	Afternoon.	4	19	21		12	2	N. 3		20	16	59		28	14	45
					5	18	52		13	6	7		21	13	58		29	17	7
In Apogee - -	7	5	0	Afternoon.	6	17	33		14	10	1		22	10	3		30	18	35
In Perigee - -	20	1	0	Afternoon.	7	15	28		15	13	33		23	5	36		31	19	17
					8	12	46		16	16	27		24	0	56				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

JULY, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
W.	1	1	47	12	3	2	14	12	5	1	58	9	11	2	30	10	1	2	7	10	9	2	42	10	11	10.9
Th.	2	2	40	12	8	3	4	12	9	2	57	10	3	3	22	10	4	3	12	11	0	3	39	11	2	11.9
F.	3	3	26	12	11	3	47	13	1	3	46	10	6	4	9	10	8	4	5	11	3	4	30	11	5	12.9
S.	4	4	8	13	3	4	28	13	5	4	32	10	9	4	53	10	11	4	54	11	6	5	15	11	6	○
S.	5	4	47	13	7	5	6	13	8	5	13	10	11	5	33	11	0	5	35	11	7	5	53	11	7	14.0
M.	6	5	24	13	8	5	41	13	8	5	51	11	0	6	8	11	0	6	11	11	8	6	28	11	8	15.9
Tu.	7	5	58	13	6	6	15	13	5	6	25	10	11	6	41	10	11	6	46	11	7	7	3	11	7	16.9
W.	8	6	32	13	4	6	50	13	2	6	58	10	10	7	16	10	8	7	19	11	7	7	36	11	6	17.9
Th.	9	7	9	13	0	7	28	12	10	7	34	10	7	7	52	10	6	7	54	11	6	8	11	11	5	18.9
F.	10	7	48	12	8	8	9	12	5	8	9	10	4	8	27	10	2	8	28	11	4	8	46	11	2	19.9
S.	11	8	30	12	1	8	52	11	10	8	45	10	0	9	5	9	10	9	3	11	0	9	21	10	11	20.9
S.	12	9	15	11	6	9	41	11	4	9	26	9	8	9	48	9	7	9	40	10	9	10	5	10	6	21.9
M.	13	10	11	11	2	10	42	11	1	10	13	9	5	10	41	9	4	10	34	10	4	11	4	10	3	○
Tu.	14	11	16	11	2	11	49	11	4	11	14	9	4	11	46	9	4	11	35	10	2	—	—	—	—	23.9
W.	15	—	—	—	—	0	21	11	6	—	—	—	—	0	19	9	6	0	3	10	1	0	32	10	3	24.9
Th.	16	0	54	11	10	1	23	12	2	0	54	9	8	1	29	9	11	1	5	10	5	1	38	10	8	25.9
F.	17	1	52	12	7	2	20	13	0	2	4	10	2	2	36	10	6	2	13	11	0	2	48	11	3	26.9
S.	18	2	48	13	6	3	15	13	11	3	6	10	10	3	35	11	2	3	21	11	7	3	53	11	11	27.9
S.	19	3	41	14	5	4	7	14	10	4	3	11	6	4	30	11	9	4	23	12	3	4	52	12	6	●
M.	20	4	32	15	2	4	57	15	6	4	57	12	0	5	24	12	3	5	19	12	8	5	44	12	10	0.6
Tu.	21	5	22	15	9	5	46	15	9	5	49	12	4	6	13	12	4	6	9	13	0	6	33	13	1	1.6
W.	22	6	10	15	8	6	34	15	6	6	36	12	4	7	0	12	3	6	57	13	1	7	21	13	0	2.6
Th.	23	6	59	15	3	7	25	14	11	7	24	12	1	7	48	11	10	7	45	12	11	8	8	12	9	3.6
F.	24	7	50	14	6	8	15	14	1	8	12	11	7	8	34	11	4	8	31	12	7	8	53	12	3	4.6
S.	25	8	41	13	6	9	7	12	11	8	56	11	0	9	19	10	7	9	14	12	0	9	34	11	8	5.6
S.	26	9	34	12	5	10	2	11	11	9	43	10	3	10	7	10	0	9	58	11	4	10	25	10	11	○
M.	27	10	33	11	7	11	6	11	4	10	33	9	8	11	5	9	6	10	56	10	7	11	26	10	4	7.6
Tu.	28	11	42	11	3	—	—	—	—	11	39	9	4	—	—	—	—	11	57	10	1	—	—	—	—	8.6
W.	29	0	16	11	2	0	50	11	3	0	14	9	3	0	50	9	3	0	28	10	0	1	1	10	0	9.6
Th.	30	1	24	11	4	1	53	11	7	1	28	9	4	2	2	9	6	1	37	10	1	2	12	10	3	10.6
F.	31	2	21	11	10	2	47	12	1	2	35	9	8	3	3	9	10	2	47	10	6	3	17	10	8	11.6

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 35	Sub.	9	4 56	Sub.	17	5 52	Sub.	25	6 14	Sub.
2	3 47		10	5 9		18	5 56		26	6 14	
3	3 58		11	5 13		19	6 0		27	6 13	
4	4 8		12	5 20		20	6 4		28	6 12	
5	4 19		13	5 28		21	6 7		29	6 11	
6	4 29		14	5 34		22	6 10		30	6 8	
7	4 38		15	5 41		23	6 12		31	6 5	
8	4 47		16	5 46		24	6 13				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	10 54	2 20	15 11	2 42	16 4	4 1	13 5	4 27	14 1	10 15	11 3	10 37	11 5
S.	2	11 42	3 1	16 9	3 20	17 1	4 49	13 10	5 10	14 6	10 57	11 6	11 16	11 8
M.	3	morn.	3 39	17 4	3 57	17 6	5 30	14 2	5 49	14 10	11 35	11 9	11 53	11 11
Tu.	4	0 28	4 14	17 8	4 30	17 10	6 7	14 4	6 24	15 1	—	—	0 11	12 0
W.	5	1 12	4 46	17 11	5 2	17 11	6 41	14 6	6 57	15 1	0 28	12 0	0 45	12 0
Th.	6	1 56	5 18	17 11	5 33	17 10	7 10	14 5	7 24	14 11	1 2	12 0	1 17	12 0
F.	7	2 39	5 49	17 9	6 5	17 7	7 40	14 2	7 56	14 6	1 33	12 0	1 50	11 11
S.	8	3 22	6 22	17 4	6 40	17 0	8 12	13 9	8 29	14 0	2 6	11 11	2 23	11 10
S.	9	4 5	6 58	16 7	7 18	16 3	8 43	13 6	8 59	13 7	2 41	11 8	2 59	11 6
M.	10	4 50	7 40	15 9	8 2	15 3	9 17	13 1	9 37	13 1	3 18	11 4	3 39	11 2
Tu.	11	5 38	8 26	14 10	8 54	14 5	10 0	12 8	10 25	12 7	4 0	11 0	4 24	10 9
W.	12	6 28	9 24	14 2	10 0	14 2	10 54	12 5	11 27	12 3	4 51	10 6	5 19	10 4
Th.	13	7 21	10 39	14 2	11 19	14 5	—	—	0 6	12 4	5 53	10 3	6 29	10 2
F.	14	8 19	12 0	14 10	—	—	0 46	12 5	1 26	12 10	7 8	10 4	7 47	10 7
S.	15	9 18	0 38	15 5	1 11	16 3	2 8	13 0	2 47	13 9	8 27	11 0	9 2	11 5
S.	16	10 20	1 42	17 1	2 10	17 11	3 24	13 11	3 55	14 9	9 34	11 10	10 5	12 3
M.	17	11 21	2 36	18 9	3 2	19 7	4 25	14 9	4 54	15 9	10 32	12 7	10 58	12 11
Tu.	18	0 20	3 27	20 2	3 52	20 7	5 22	15 6	5 48	16 5	11 24	13 2	11 49	13 3
W.	19	1 17	4 16	20 10	4 39	21 0	6 14	16 0	6 39	16 10	—	—	0 13	13 6
Th.	20	2 12	5 1	21 0	5 23	20 9	7 2	16 2	7 22	16 8	0 37	13 7	1 1	13 6
F.	21	3 5	5 45	20 5	6 8	20 0	7 44	15 11	8 5	16 3	1 23	13 5	1 46	13 4
S.	22	3 56	6 30	19 4	6 52	18 7	8 26	15 6	8 46	15 6	2 8	13 1	2 31	12 10
S.	23	4 46	7 12	17 10	7 35	16 11	9 4	14 9	9 23	14 6	2 53	12 6	3 14	12 2
M.	24	5 36	7 59	16 0	8 23	15 2	9 44	13 11	10 5	13 5	3 36	11 9	3 58	11 4
Tu.	25	6 25	8 50	14 5	9 21	13 10	10 27	12 11	10 53	12 6	4 20	10 11	4 46	10 6
W.	26	7 14	9 57	13 5	10 36	13 3	11 23	12 2	11 58	11 11	5 15	10 2	5 50	9 11
Th.	27	8 3	11 18	13 2	11 57	13 3	—	—	0 35	12 0	6 26	9 9	7 7	9 9
F.	28	8 51	—	—	0 34	13 8	1 14	11 10	1 53	12 4	7 45	9 10	8 23	10 1
S.	29	9 39	1 7	14 1	1 36	14 8	2 31	12 3	3 3	13 1	8 58	10 4	9 27	10 8
S.	30	10 25	1 59	15 3	2 22	15 10	3 34	12 10	4 0	13 9	9 53	10 11	10 17	11 2
M.	31	11 10	2 41	16 5	2 59	16 11	4 24	13 6	4 46	14 5	10 37	11 5	10 55	11 9

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - - -	3	11	52	Morning.
Last Quarter	11	0	28	Afternoon.
New - - - - -	18	5	11	Morning.
First Quarter	25	0	47	Morning.
In Apogee - -	3	11	0	Afternoon.
In Perigee - -	17	11	0	Afternoon.
In Apogee - -	31	3	0	Morning.

M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'
1	19	8. 2	9	4	N. 54	17	15	N. 28	25	16	S. 32
2	17	57	10	8	47	18	11	53	26	18	18
3	16	6	11	12	22	19	7	33	27	19	11
4	13	33	12	15	26	20	2	49	28	19	12
5	10	27	13	17	45	21	1	S. 58	29	18	17
6	6	56	14	19	4	22	6	30	30	16	37
7	3	6	15	19	10	23	10	32	31	14	1
8	0	N. 53	16	17	57	24	13	56			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.															
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																	
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																
H.	M.	P.	L.	H.	M.	P.	L.	H.	M.	P.	L.	H.	M.	P.	L.	D.													
9	38	16	2	10	1	16	6	11	30	14	4	11	53	14	6	0	33	16	6	0	58	16	9	12	0	6			
10	23	16	9	10	44	17	0	—	—	—	—	0	14	14	9	1	23	17	0	1	45	17	3	13	0	6			
11	4	17	2	11	25	17	5	0	34	14	11	0	53	15	0	2	4	17	6	2	23	17	9	14	0	6			
11	44	17	7	—	—	—	—	1	12	15	2	1	29	15	4	2	42	17	11	3	0	18	1	15	0	6			
0	1	17	8	0	19	17	8	1	46	15	5	2	2	15	5	3	16	18	3	3	32	18	5	16	0	6			
0	36	17	9	0	53	17	9	2	18	15	5	2	34	15	5	3	47	18	5	4	3	18	6	17	0	6			
1	10	17	9	1	28	17	8	2	48	15	5	3	3	15	—	4	19	18	6	4	35	18	6	18	0	6			
1	45	17	8	2	3	17	6	3	18	15	3	3	35	15	2	4	50	18	5	5	6	18	3	19	0	6			
2	22	17	4	2	40	17	0	3	52	15	0	4	10	14	10	5	24	18	2	5	42	18	0	20	0	6			
2	59	16	9	3	20	16	4	4	28	14	7	4	48	14	4	6	0	17	9	6	19	17	6	21	0	6			
3	41	16	0	4	4	15	8	5	10	14	1	5	34	13	10	6	41	17	3	7	3	16	11	22	0	6			
4	30	15	3	4	57	14	11	6	0	13	8	6	31	13	5	7	30	16	9	7	57	16	6	23	0	6			
5	26	14	9	5	59	14	9	7	3	13	3	7	42	13	3	8	31	16	3	9	8	16	2	24	0	6			
6	34	14	11	7	13	15	5	8	21	13	4	8	59	13	7	9	47	16	1	10	27	16	3	25	0	6			
7	53	15	11	8	26	16	7	9	37	13	11	10	13	14	4	11	6	16	6	11	42	16	10	26	0	6			
8	57	17	3	9	28	17	10	10	45	14	10	11	16	15	3	—	—	—	0	14	17	3	27	0	6				
9	57	18	5	10	25	19	0	11	43	15	8	—	—	—	0	45	17	10	1	13	18	3	28	0	6				
10	53	19	6	11	20	19	10	0	9	16	1	0	35	16	6	1	40	18	9	2	5	19	4	29	0	6			
11	46	20	1	—	—	—	—	1	0	16	10	1	25	17	0	2	31	19	9	2	55	20	0	1	3	0	6		
0	11	20	3	0	36	20	3	1	49	17	1	2	11	17	2	3	17	20	3	3	41	20	4	2	3	0	6		
1	0	20	1	1	24	19	11	2	33	17	1	2	54	17	0	4	2	20	5	4	24	20	3	3	3	0	6		
1	48	19	7	2	12	19	2	3	15	16	9	3	37	16	6	4	47	20	1	5	8	19	9	4	3	0	6		
2	34	18	7	2	55	18	0	4	0	16	2	4	22	15	9	5	30	19	5	5	53	19	0	5	3	0	6		
3	17	17	4	3	38	16	8	4	44	15	3	5	6	14	9	6	14	18	6	6	37	18	0	6	3	0	6		
4	1	16	0	4	25	15	3	5	31	14	3	5	57	13	10	6	59	17	5	7	25	16	11	7	3	0	6		
4	52	14	8	5	24	14	2	6	26	13	5	7	0	13	1	7	53	16	6	8	26	16	1	8	3	0	6		
5	57	14	0	6	33	13	11	7	38	12	11	8	18	12	10	9	4	15	9	9	44	15	7	9	3	0	6		
7	10	14	1	7	49	14	6	8	58	12	11	9	35	13	1	10	23	15	6	11	3	15	6	10	3	0	6		
8	23	14	11	8	51	15	4	10	11	13	4	10	43	13	7	11	41	15	8	—	—	—	—	—	—	11	3	0	6
9	16	15	9	9	40	16	1	11	10	13	11	11	33	14	—	0	12	16	0	0	39	16	3	12	3	0	6		
10	1	16	6	10	21	16	11	11	55	14	6	—	—	—	—	1	2	16	8	1	24	17	0	13	3	0	6		
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.																			

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2		9	5	11		17	3	46		25	1	48	
2	5	57		10	5	3		18	3	33		26	1	31	
3	5	53		11	4	53		19	3	19		27	1	14	
4	5	47		12	4	43		20	3	5		28	0	57	
5	5	41		13	4	33		21	2	51		29	0	39	
6	5	35		14	4	22		22	2	36		30	0	21	
7	5	28		15	4	10		23	2	20		31	0	2	
8	5	20		16	3	58		24	2	4					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.						
S.	1	10 25 4	10 41	10 6	11 4	10 8	4 59	18 2	5 21	18 6	1 51	12 2	2 16	12 5												
S.	2	11 42	11 26	10 9	11 47	10 11	5 43	18 9	6 3	19 0	2 38	12 8	2 59	12 10												
M.	3	morn.	—	—	0 6	11 0	6 23	19 2	6 42	19 4	3 18	13 0	3 30	13 2												
Tu.	4	0 28	0 25	11 0	0 42	11 1	7 1	19 6	7 18	19 8	3 53	13 4	4 10	13 6												
W.	5	1 12	0 59	11 1	1 15	11 1	7 34	19 9	7 51	19 10	4 25	13 8	4 40	13 8												
Th.	6	1 56	1 32	11 0	1 48	11 0	8 7	19 10	8 22	19 10	4 56	13 8	5 11	13 7												
F.	7	2 39	2 3	11 0	2 19	10 11	8 37	19 10	8 53	19 8	5 27	13 6	5 44	13 4												
S.	8	3 22	2 36	10 11	2 53	10 10	9 10	19 6	9 28	19 3	6 1	13 2	6 19	13 0												
S.	9	4 5	3 10	10 9	3 28	10 7	9 46	18 11	10 4	18 7	6 38	12 10	6 58	12 7												
M.	10	4 50	3 46	10 6	4 5	10 4	10 24	18 3	10 46	17 11	7 20	12 5	7 43	12 2												
Tu.	11	5 38	4 25	10 3	4 47	10 1	11 12	17 7	11 41	17 3	8 6	11 11	8 32	11 8												
W.	12	6 28	5 12	10 0	5 40	9 10	—	—	0 15	16 11	9 3	11 5	9 35	11 3												
Th.	13	7 21	6 11	9 10	6 48	9 10	0 48	16 8	1 22	16 7	10 12	11 3	10 49	11 5												
F.	14	8 19	7 29	9 11	8 7	10 1	1 56	16 8	2 31	17 0	11 25	11 5	11 59	11 9												
S.	15	9 18	8 44	10 3	9 20	10 6	3 6	17 7	3 42	18 3	—	—	0 32	12 3												
S.	16	10 20	9 54	10 10	10 26	11 1	4 14	19 0	4 44	19 8	1 4	12 9	1 35	13 1												
M.	17	11 21	10 55	11 5	11 22	11 8	5 11	20 3	5 37	20 10	2 6	13 8	2 34	14 2												
Tu.	18	0 20	11 48	11 11	—	—	6 4	21 5	6 30	21 10	3 0	14 7	3 24	15 0												
W.	19	1 17	0 13	12 1	0 37	12 2	6 56	22 2	7 20	22 6	3 48	15 3	4 11	15 6												
Th.	20	2 12	1 1	12 3	1 24	12 3	7 44	22 6	8 6	22 6	4 34	15 7	4 56	15 6												
F.	21	3 5	1 47	12 2	2 10	12 0	8 28	22 4	8 50	22 0	5 18	15 4	5 41	15 1												
S.	22	3 56	2 33	11 11	2 55	11 9	9 13	21 7	9 36	21 0	6 4	14 8	6 28	14 3												
S.	23	4 46	3 18	11 6	3 40	11 3	9 58	20 4	10 18	19 8	6 51	13 10	7 14	13 4												
M.	24	5 36	4 0	10 11	4 22	10 8	10 42	18 11	11 9	18 3	7 38	12 10	8 3	12 4												
Tu.	25	6 25	4 44	10 5	5 9	10 2	11 38	17 7	—	—	8 29	11 11	8 58	11 3												
W.	26	7 14	5 36	9 11	6 7	9 9	0 11	16 11	0 45	16 4	9 31	11 1	10 8	10 9												
Th.	27	8 3	6 45	9 7	7 26	9 7	1 20	16 0	1 54	15 10	10 45	10 8	11 22	10 6												
F.	28	8 51	8 6	9 7	8 43	9 8	2 29	15 11	3 4	16 2	11 57	10 10	—	—												
S.	29	9 39	9 18	9 10	9 50	10 0	3 39	16 8	4 12	17 3	0 31	11 1	1 2	11 5												
S.	30	10 25	10 19	10 3	10 44	10 5	4 39	17 7	5 2	18 0	1 29	11 9	1 54	12 1												
M.	31	11 10	11 6	10 7	11 26	10 10	5 23	18 5	5 42	18 9	2 18	12 5	2 38	12 8												
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
S.	1	1 59	11 0	2 21	11 3	0 52	13 9	1 15	14 1	7 13	10 11	7 31	11 4	12.6
S.	2	2 42	11 6	3 0	11 9	1 37	14 5	1 57	14 9	7 48	11 8	8 5	11 11	13.6
M.	3	3 18	11 11	3 36	12 1	2 16	14 11	2 34	15 2	8 22	12 2	8 39	12 3	○
T.	4	3 53	12 3	4 9	12 4	2 51	15 4	3 7	15 5	8 55	12 4	9 11	12 5	15.6
W.	5	4 25	12 6	4 42	12 5	3 22	15 5	3 38	15 5	9 27	12 4	9 43	12 4	16.6
Th.	6	4 59	12 4	5 15	12 3	3 54	15 4	4 9	15 3	9 59	12 3	10 15	12 2	17.6
F.	7	5 31	12 3	5 48	12 2	4 25	15 2	4 42	15 1	10 32	12 1	10 50	11 11	18.6
S.	8	6 5	12 1	6 23	11 11	4 59	15 0	5 17	14 10	11 9	11 9	11 29	11 6	19.6
S.	9	6 41	11 9	7 0	11 7	5 36	14 8	5 56	14 5	11 49	11 3	—	—	20.6
M.	10	7 21	11 4	7 45	11 1	6 18	14 2	6 41	13 10	0 9	11 0	0 32	10 8	21.6
Tu.	11	8 10	10 9	8 38	10 5	7 5	13 6	7 33	13 3	0 57	10 5	1 24	10 2	○
W.	12	9 12	10 3	9 47	10 1	8 5	13 0	8 38	12 10	1 57	9 11	2 31	9 9	23.6
Th.	13	10 24	10 2	11 1	10 3	9 17	12 9	9 55	12 11	3 10	9 9	3 52	9 9	24.6
F.	14	11 37	10 6	—	—	10 31	13 1	11 6	13 5	4 30	9 11	5 7	10 1	25.6
S.	15	0 13	10 9	0 47	11 2	11 40	13 10	—	—	5 42	10 5	6 12	11 0	26.6
S.	16	1 16	11 7	1 44	12 0	0 10	14 4	0 38	14 11	6 38	11 8	7 2	12 4	27.6
M.	17	2 11	12 6	2 36	13 0	1 5	15 6	1 31	16 1	7 25	13 0	7 48	13 8	28.6
Tu.	18	3 0	13 6	3 24	13 11	1 57	16 8	2 23	17 1	8 11	14 1	8 34	14 4	●
W.	19	3 48	14 2	4 12	14 4	2 46	17 4	3 8	17 6	8 56	14 6	9 19	14 6	1.3
Th.	20	4 35	14 5	4 58	14 3	3 30	17 7	3 53	17 5	9 42	14 5	10 5	14 3	2.3
F.	21	5 21	14 1	5 45	13 10	4 16	17 3	4 39	17 0	10 29	13 11	10 53	13 6	3.3
S.	22	6 9	13 6	6 32	13 2	5 2	16 8	5 26	16 3	11 17	13 1	11 41	12 7	4.3
S.	23	6 54	12 9	7 16	12 4	5 49	15 9	6 12	15 3	—	—	0 4	12 0	5.3
M.	24	7 40	11 9	8 7	11 3	6 36	14 7	7 2	14 1	0 28	11 6	0 54	10 11	6.3
Tu.	25	8 35	10 8	9 7	10 3	7 30	13 6	8 1	13 0	1 21	10 5	1 52	10 0	7.3
W.	26	9 42	9 11	10 20	9 9	8 35	12 7	9 14	12 4	2 26	9 7	3 7	9 3	8.3
Th.	27	10 58	9 8	11 36	9 8	9 52	12 3	10 29	12 3	3 49	9 1	4 29	9 0	9.3
F.	28	—	—	0 11	9 10	11 4	12 4	11 38	12 7	5 5	9 0	5 40	9 3	10.3
S.	29	0 45	10 0	1 14	10 3	—	—	0 8	12 10	6 10	9 7	6 34	10 0	11.3
S.	30	1 39	10 6	2 1	10 10	0 33	13 3	0 56	13 8	6 55	10 5	7 14	10 11	12.3
M.	31	2 22	11 2	2 41	11 6	1 17	14 1	1 37	14 6	7 31	11 4	7 46	11 9	13.3
Half Mean Spring } Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2	Sub.	9	5	11	Sub.	17	3	46	Sub.	25	1	48	Sub.
2	5	57		10	5	3		18	3	33		26	1	31	
3	5	53		11	4	53		19	3	19		27	1	14	
4	5	47		12	4	43		20	3	5		28	0	57	
5	5	41		13	4	33		21	2	51		29	0	39	
6	5	35		14	4	22		22	2	36		30	0	21	
7	5	28		15	4	10		23	2	20		31	0	2	
8	5	20		16	3	58		24	2	4					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. . | THURSO add 14 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																							
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
S.	1	10 25 4	10 35	8 9	10 58	8 10	9 55	22 8	10 16	23 1	4 35	17 9	5 0	18 1																													
S.	2	11 42	11 20	8 11	11 41	9 0	10 35	23 4	10 54	23 8	5 24	18 6	5 4	18 10																													
M.	3	morn.	—	—	0 1	9 1	11 13	23 11	11 32	24 2	6 5	19 1	6 23	19 4																													
Tu.	4	0 28	0 21	9 2	0 38	9 3	11 50	24 5	—	—	6 41	19 7	6 57	19 9																													
W.	5	1 12	0 55	9 4	1 12	9 4	0 6	24 6	0 22	24 8	7 13	19 9	7 29	19 10																													
Th.	6	1 56	1 29	9 5	1 44	9 5	0 39	24 8	0 54	24 8	7 44	19 9	7 59	19 9																													
F.	7	2 39	1 59	9 5	2 15	9 5	1 10	24 8	1 25	24 5	8 15	19 7	8 32	19 3																													
S.	8	3 22	2 31	9 5	2 48	9 4	1 42	24 2	1 58	23 11	8 50	19 3	9 8	18 11																													
S.	9	4 5	3 6	9 3	3 23	9 2	2 15	23 6	2 33	23 2	9 25	18 7	9 45	18 3																													
M.	10	4 50	3 41	9 0	4 2	8 11	2 52	22 9	3 13	22 4	10 2	17 10	10 22	17 3																													
Tu.	11	5 38	4 24	8 10	4 49	8 9	3 36	21 10	4 12	21 4	10 44	17 0	11 7	16 1																													
W.	12	6 28	5 16	8 7	5 45	8 6	4 31	20 10	5 3	20 6	11 32	16 1	—	—																													
Th.	13	7 21	6 19	8 5	6 55	8 4	5 41	20 6	6 22	20 7	0 2	15 11	0 36	15 1																													
F.	14	8 19	7 33	8 5	8 12	8 6	7 2	21 0	7 40	21 6	1 17	16 1	2 1	16 1																													
S.	15	9 18	8 50	8 9	9 24	9 0	8 17	22 3	8 48	23 2	2 42	17 3	3 19	18 1																													
S.	16	10 20	9 55	9 2	10 25	9 5	9 18	24 1	9 45	24 11	3 53	19 0	4 26	19 1																													
M.	17	11 21	10 54	9 7	11 22	9 9	10 11	25 9	10 36	26 6	4 57	20 7	5 26	21 1																													
Tu.	18	0 20	11 49	10 0	—	—	11 2	27 1	11 27	27 7	5 54	21 11	6 19	22 1																													
W.	19	1 17	0 15	10 2	0 40	10 3	11 52	27 11	—	—	6 43	22 9	7 6	23 1																													
Th.	20	2 12	1 4	10 4	1 27	10 4	0 16	28 2	0 39	28 2	7 28	22 10	7 50	22 1																													
F.	21	3 5	1 50	10 4	2 12	10 3	1 1	27 11	1 23	27 6	8 13	22 4	8 36	21 1																													
S.	22	3 56	2 34	10 1	2 56	9 11	1 45	26 10	2 7	26 2	8 59	21 3	9 19	20 1																													
S.	23	4 46	3 17	9 9	3 37	9 6	2 28	25 4	2 48	24 6	9 39	19 9	9 59	19 1																													
M.	24	5 36	3 59	9 4	4 21	9 1	3 10	23 7	3 32	22 8	10 19	18 2	10 40	17 1																													
Tu.	25	6 25	4 45	8 10	5 11	8 7	3 57	21 9	4 26	20 11	11 2	16 6	11 28	15 1																													
W.	26	7 14	5 41	8 5	6 16	8 2	4 59	20 2	5 38	19 8	12 0	15 3	—	—																													
Th.	27	8 3	6 52	8 0	7 32	8 0	6 19	19 6	7 2	19 7	0 33	15 0	1 16	14 1																													
F.	28	8 51	8 10	8 1	8 46	8 2	7 39	19 9	8 15	20 3	1 58	15 0	2 38	15 1																													
S.	29	9 39	9 20	8 4	9 49	8 6	8 46	20 9	9 12	21 5	3 15	15 11	3 45	15 1																													
S.	30	10 25	10 14	8 7	10 37	8 9	9 35	22 0	9 57	22 7	4 12	17 2	4 37	17 1																													
M.	31	11 10	10 58	8 10	11 18	9 0	10 15	23 1	10 33	23 7	5 1	18 3	5 22	18 1																													
Half Mean Spring Range.			4ft. 10in.								13ft. 0in.								10ft. 6in.																								
Phases of the Moon.																						Moon's Declination at Noon.																					
D. H. M.																						M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'				
Full - - - - - 3 11 52 Morning.																						1	19	8. 2	9	4	N. 54	17	15	N. 28	25	16	S. 3	25	16	S. 3	25	16	S. 3				
Last Quarter - 11 0 28 Afternoon.																						2	17	57	10	8	47	18	11	53	26	18	1	26	18	1	26	18	1				
New - - - - - 18 5 11 Morning.																						3	16	6	11	12	22	19	7	33	27	19	1	27	19	1	27	19	1				
First Quarter - 25 0 47 Morning.																						4	13	33	12	15	26	20	2	49	28	19	1	28	19	1	28	19	1				
																						5	10	27	13	17	45	21	1	S. 58	29	18	1	29	18	1	29	18	1				
In Apogee - - 3 11 0 Afternoon.																						6	6	56	14	19	4	22	6	30	30	16	3	30	16	3	30	16	3				
In Perigee - - 17 11 0 Afternoon.																						7	3	6	15	19	10	23	10	32	31	14	1	31	14	1	31	14	1				
In Apogee - - 31 3 0 Morning.																						8	0	N. 53	16	17	57	24	13	56	—	—	—	—	—	—	—	—	—				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required. —
GREENOCK add 19 m; | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.				
S.	1	5	16	31	11	5	42	32	7	8	51	14	0	9	11	14	3	9	49	9	9	10	11	9	11	12	6
S.	2	6	5	33	2	6	27	33	8	9	30	14	5	9	49	14	7	10	29	10	0	10	46	10	2	13	6
M.	3	6	47	34	1	7	7	34	6	10	7	14	9	10	24	14	11	11	4	10	3	12	21	10	5		0
Tu.	4	7	25	34	10	7	40	35	3	10	40	15	0	10	53	15	2	11	38	10	5	11	54	10	6	15	6
W.	5	7	56	35	4	8	12	35	5	11	8	15	2	11	24	15	2	—	—	0	11	10	5	16	6		
Th.	6	8	27	35	5	8	42	35	6	11	40	15	2	11	56	15	1	0	27	10	5	0	43	10	5	17	6
F.	7	8	57	35	4	9	12	35	2	—	—	0	13	15	0	1	0	10	4	1	17	10	3	18	6		
S.	8	9	28	34	10	9	44	34	4	0	31	14	10	0	51	14	8	1	34	10	2	1	52	10	1	19	6
S.	9	9	59	33	9	10	15	33	2	1	11	14	6	1	31	14	3	2	11	9	11	2	30	9	10	20	6
M.	10	10	32	32	5	10	50	31	8	1	51	14	0	2	14	13	9	2	51	9	8	3	13	9	7	21	6
Tu.	11	11	11	31	0	11	36	30	2	2	38	13	6	3	5	13	3	3	37	9	5	4	3	9	3		0
W.	12	—	—	—	0	0	4	29	8	3	38	13	0	4	12	12	10	4	35	9	1	5	8	9	0	23	6
Th.	13	0	38	29	4	1	15	29	4	4	50	12	10	5	28	12	11	5	42	8	11	6	17	9	0	24	6
F.	14	1	54	29	8	2	34	30	3	6	5	13	2	6	40	13	6	6	52	9	2	7	27	9	5	25	6
S.	15	3	16	31	3	3	55	32	0	7	13	13	10	7	44	14	4	8	3	9	8	8	36	9	11	26	6
S.	16	4	32	33	10	5	6	35	2	8	14	14	11	8	40	15	4	9	8	10	3	9	39	10	6	27	6
M.	17	5	38	36	6	6	8	37	9	9	5	15	10	9	31	16	4	10	5	10	9	10	29	11	1	28	6
Tu.	18	6	36	38	8	7	2	39	5	9	56	16	9	10	19	17	0	10	52	11	4	11	16	11	6		0
W.	19	7	27	40	1	7	50	40	4	10	40	17	2	11	1	17	3	11	39	11	7	—	—	—	—	1	3
Th.	20	8	12	40	4	8	33	40	1	11	23	17	3	11	46	17	1	0	3	11	8	0	27	11	7	2	3
F.	21	8	54	39	8	9	15	39	0	—	—	0	10	16	10	0	50	11	5	1	14	11	4	3	3		
S.	22	9	36	38	1	9	54	36	11	0	34	16	6	1	0	16	1	1	37	11	1	2	0	10	10	4	3
S.	23	10	12	35	8	10	29	34	4	1	23	15	7	1	46	15	1	2	23	10	6	2	46	10	3	5	3
M.	24	10	47	33	0	11	8	31	7	2	10	14	6	2	35	14	0	3	9	10	0	3	34	9	9	6	3
Tu.	25	11	32	30	3	—	—	—	—	3	2	13	6	3	33	13	0	4	0	9	5	4	31	9	1		0
W.	26	0	1	29	1	0	36	28	2	4	7	12	7	4	47	12	5	5	5	8	10	5	40	8	8	8	3
Th.	27	1	12	27	10	1	53	27	8	5	25	12	3	6	3	12	4	6	15	8	8	6	50	8	9	9	3
F.	28	2	32	27	10	3	11	28	4	6	38	12	5	7	12	12	8	7	25	8	10	7	59	9	0	10	3
S.	29	3	49	29	0	4	22	29	11	7	42	12	11	8	8	13	3	8	32	9	2	9	1	9	4	11	3
S.	30	4	51	30	10	5	18	31	10	8	31	13	7	8	52	13	11	9	27	9	6	9	51	9	9	12	3
M.	31	5	42	32	8	6	3	33	6	9	10	14	3	9	28	14	7	10	10	9	11	10	27	10	1	13	3
Half Mean Spring } Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.									

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2		9	5	11		17	3	46		25	1	48	
2	5	57		10	5	3		18	3	33		26	1	31	
3	5	53		11	4	53		19	3	19		27	1	14	
4	5	47		12	4	43		20	3	5		28	0	57	
5	5	41		13	4	33		21	2	51		29	0	39	
6	5	35		14	4	22		22	2	36		30	0	21	
7	5	28		15	4	10		23	2	20		31	0	2	
8	5	20		16	3	58		24	2	4					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
S.	1	10a 54	9 25	8 8	9 46	8 10	6 35	6 8	6 57	6 9	3 53	9 6	4 13	9 9	
S.	2	11 42	10 6	8 11	10 25	9 0	7 18	6 10	7 38	6 11	4 32	10 0	4 51	10 2	
M.	3	morn.	10 43	9 0	11 0	9 1	7 57	7 0	8 14	7 2	5 11	10 4	5 30	10 6	
Tu.	4	0 28	11 16	9 1	11 31	9 1	8 30	7 3	8 44	7 3	5 47	10 7	6 1	10 8	
W.	5	1 12	11 46	9 1	—	—	8 58	7 3	9 13	7 2	6 16	10 7	6 32	10 7	
Th.	6	1 56	0 2	9 1	0 19	9 1	9 28	7 1	9 43	7 1	6 48	10 6	7 4	10 5	
F.	7	2 39	0 35	9 1	0 52	9 1	9 58	7 0	10 14	6 11	7 20	10 3	7 37	10 1	
S.	8	3 22	1 10	9 1	1 30	9 0	10 31	6 10	10 49	6 8	7 54	9 11	8 12	9 8	
S.	9	4 5	1 50	8 11	2 11	8 10	11 9	6 6	11 34	6 4	8 31	9 6	8 52	9 3	
M.	10	4 50	2 33	8 9	2 56	8 7	—	—	0 1	6 1	9 16	9 1	9 43	8 11	
Tu.	11	5 38	3 20	8 6	3 47	8 5	0 32	5 11	1 5	5 9	10 12	8 9	10 46	8 7	
W.	12	6 28	4 18	8 4	4 50	8 3	1 43	5 8	2 23	5 8	11 20	8 6	11 56	8 6	
Th.	13	7 21	5 24	8 2	5 59	8 2	3 1	5 9	3 36	6 0	—	—	0 32	8 7	
F.	14	8 19	6 35	8 2	7 12	8 3	4 9	6 3	4 39	6 5	1 9	8 9	1 45	8 11	
S.	15	9 18	7 48	8 5	8 18	8 8	5 6	6 8	5 32	6 11	2 20	9 3	2 50	9 8	
S.	16	10 20	8 47	8 11	9 15	9 2	5 58	7 2	6 25	7 5	3 18	10 1	3 43	10 6	
M.	17	11 21	9 42	9 5	10 7	9 7	6 52	7 8	7 19	7 11	4 7	11 0	4 33	11 4	
Tu.	18	0a 20	10 31	9 9	10 55	9 10	7 45	8 1	8 9	8 3	4 59	11 9	5 25	12 0	
W.	19	1 17	11 18	9 11	11 40	9 11	8 31	8 5	8 52	8 5	5 48	12 2	6 10	12 2	
Th.	20	2 12	—	—	0 2	9 11	9 13	8 4	9 34	8 2	6 32	12 1	6 55	11 19	
F.	21	3 5	0 25	9 10	0 49	9 9	9 55	8 0	10 17	7 9	7 18	11 7	7 40	11 3	
S.	22	3 56	1 13	9 8	1 38	9 6	10 39	7 6	11 1	7 3	8 2	10 11	8 24	10 6	
S.	23	4 46	2 2	9 4	2 27	9 2	11 26	6 11	11 56	6 7	8 46	10 1	9 11	9 8	
M.	24	5 36	2 52	8 11	3 17	8 8	—	—	0 27	6 2	9 40	9 3	10 10	8 11	
Tu.	25	6 25	3 44	8 6	4 13	8 3	1 2	5 11	1 38	5 9	10 42	8 7	11 17	8 4	
W.	26	7 14	4 46	8 2	5 20	8 0	2 19	5 7	2 58	5 6	11 53	8 2	—	—	
Th.	27	8 3	5 55	7 11	6 34	7 10	3 33	5 8	4 7	5 9	0 29	8 1	1 7	8 1	
F.	28	8 51	7 11	7 10	7 46	7 11	4 37	5 10	5 6	6 0	1 43	8 2	2 18	8 4	
S.	29	9 39	8 17	8 1	8 42	8 3	5 32	6 2	5 54	6 3	2 49	8 7	3 13	8 11	
S.	30	10 25	9 5	8 6	9 27	8 8	6 15	6 5	6 37	6 7	3 35	9 2	3 54	9 6	
M.	31	11 10	9 46	8 10	10 4	8 11	6 57	6 9	7 16	6 11	4 12	9 10	4 30	10 1	
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	3	11	52	Morning.			1	19	S. 2	9	4	N. 54	17	15	N. 28
Last Quarter -	11	0	28	Afternoon.			2	17	57	10	8	47	18	11	53
New - - - - -	18	5	11	Morning.			3	16	6	11	12	22	19	7	33
First Quarter	25	0	47	Morning.			4	13	33	12	15	26	20	2	49
							5	10	27	13	17	45	21	18	58
In Apogee - -	3	11	0	Afternoon.			6	6	56	14	19	4	22	6	30
In Perigee - -	17	11	0	Afternoon.			7	3	6	15	19	10	23	10	32
In Apogee - -	31	3	0	Morning.			8	0	N. 53	16	17	57	24	13	56

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

AUGUST, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			D.					
S.	1	3	11	12	4	3	32	12	7	3	29	10	1	3	52	10	4	3	45	10	10	4	11	11	1	12°6	
S.	2	3	52	12	10	4	11	13	1	4	14	10	6	4	34	10	8	4	34	11	3	4	56	11	4	13°6	
M.	3	4	30	13	4	4	47	13	7	4	53	10	10	5	13	10	11	5	16	11	6	5	34	11	7	○	
Tu.	4	5	4	13	9	5	20	13	11	5	31	11	1	5	48	11	1	5	51	11	8	6	7	11	9	15°6	
W.	5	5	37	13	11	5	54	13	11	6	4	11	2	6	20	11	2	6	24	11	10	6	41	11	10	16°6	
Th.	6	6	10	13	11	6	26	13	10	6	36	11	2	6	51	11	2	6	57	11	11	7	13	11	11	17°6	
F.	7	6	42	13	9	6	59	13	7	7	7	11	1	7	24	11	0	7	29	11	10	7	45	11	10	18°6	
S.	8	7	17	13	5	7	36	13	2	7	41	10	10	7	59	10	8	8	1	11	9	8	18	11	8	19°6	
S.	9	7	55	12	11	8	16	12	7	8	16	10	6	8	33	10	4	8	34	11	6	8	51	11	4	20°6	
M.	10	8	38	12	3	9	2	11	10	8	52	10	2	9	14	9	11	9	9	11	2	9	28	10	11	21°6	
Tu.	11	9	27	11	7	9	57	11	3	9	36	9	9	10	1	9	6	9	50	10	9	10	19	10	6	○	
W.	12	10	29	11	1	11	5	11	1	10	29	9	4	11	4	9	3	10	51	10	3	11	24	10	1	23°6	
Th.	13	11	44	11	2	—	—	—	—	11	41	9	4	—	—	—	—	11	58	10	0	—	—	—	—	—	24°6
F.	14	0	21	11	5	0	57	11	9	0	19	9	5	0	58	9	8	0	33	10	2	1	9	10	4	25°6	
S.	15	1	32	12	3	2	2	12	9	1	39	9	11	2	15	10	3	1	47	10	8	2	25	11	1	26°6	
S.	16	2	32	13	4	3	1	13	11	2	47	10	8	3	19	11	1	3	2	11	6	3	35	11	10	27°6	
M.	17	3	27	14	5	3	53	15	0	3	48	11	6	4	16	11	11	4	7	12	3	4	37	12	8	28°6	
Tu.	18	4	19	15	6	4	43	15	10	4	42	12	3	5	8	12	6	5	5	12	11	5	30	13	1	●	
W.	19	5	6	16	1	5	29	16	3	5	33	12	8	5	57	12	8	5	54	13	3	6	17	13	4	1°3	
Th.	20	5	53	16	3	6	16	16	0	6	25	12	8	6	42	12	7	6	41	13	5	7	4	13	4	2°3	
F.	21	6	39	15	9	7	2	15	5	7	5	12	5	7	28	12	2	7	26	13	3	7	47	13	0	3°3	
S.	22	7	25	14	11	7	48	14	5	7	50	11	10	8	10	11	6	8	8	12	9	8	28	12	6	4°3	
S.	23	8	10	13	10	8	34	13	2	8	30	11	2	8	50	10	8	8	47	12	1	9	6	11	9	5°3	
M.	24	8	59	12	5	9	24	11	10	9	11	10	3	9	33	9	11	9	25	11	4	9	47	10	11	6°3	
Tu.	25	9	52	11	3	10	25	10	10	9	57	9	6	10	25	9	2	10	15	10	6	10	47	10	1	7°3	
W.	26	11	2	10	7	11	41	10	6	11	0	8	11	11	38	8	10	11	21	9	9	11	55	9	7	8°3	
Th.	27	—	—	—	—	0	19	10	6	—	—	—	—	0	17	8	10	—	—	—	—	0	31	9	6	9°3	
F.	28	0	55	10	7	1	30	10	10	0	55	8	10	1	34	9	0	1	7	9	7	1	43	9	9	10°3	
S.	29	2	0	11	4	2	25	11	7	2	11	9	3	2	40	9	6	2	20	10	0	2	52	10	4	11°3	
S.	30	2	49	11	11	3	13	12	4	3	6	9	9	3	31	10	1	3	21	10	7	3	47	10	10	12°3	
M.	31	3	32	12	8	3	50	13	0	3	52	10	4	4	12	10	7	4	11	11	1	4	33	11	1	13°3	
Half Mean Spring Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.									

Half Mean Spring } 7ft. 5in. 5ft. 10in. 6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2	Sub.	9	5	11	Sub.	17	3	46	Sub.	25	1	48	Sub.
2	5	57		10	5	3		18	3	33		26	1	31	
3	5	53		11	4	53		19	3	19		27	1	14	
4	5	47		12	4	43		20	3	5		28	0	57	
5	5	41		13	4	33		21	2	51		29	0	39	
6	5	35		14	4	22		22	2	36		30	0	21	
7	5	28		15	4	10		23	2	20		31	0	2	
8	5	20		16	3	58		24	2	4					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
Tu.	1	11 54	3 16	17 5	3 33	17 9	5 6	14 0	5 25	14 10	11 12	11 10	11 29	12 3
W.	2	morn.	3 49	18 0	4 5	18 3	5 43	14 4	5 59	15 2	11 44	12 2	12 0	12 3
Th.	3	0 38	4 21	18 5	4 36	18 7	6 15	14 8	6 31	15 4	—	—	0 17	12 4
F.	4	1 21	4 52	18 8	5 8	18 7	6 47	14 10	7 1	15 1	0 34	12 4	0 51	12 4
S.	5	2 4	5 23	18 6	5 38	18 5	7 16	14 8	7 31	14 11	1 8	12 4	1 24	12 4
S.	6	2 49	5 54	18 2	6 11	17 11	7 47	14 6	8 4	14 6	1 39	12 3	1 55	12 2
M.	7	3 35	6 30	17 5	6 49	16 11	8 21	14 1	8 37	13 11	2 12	12 1	2 31	11 11
Tu.	8	4 23	7 9	16 5	7 31	15 10	8 54	13 8	9 12	13 5	2 50	11 8	3 9	11 6
W.	9	5 14	7 53	15 3	8 20	14 7	9 34	13 2	9 59	12 10	3 30	11 3	3 52	11 3
Th.	10	6 8	8 51	14 2	9 29	13 11	10 26	12 9	10 58	12 5	4 17	10 8	4 47	10 5
F.	11	7 5	10 11	13 11	10 55	14 2	11 35	12 7	—	—	5 23	10 2	6 2	10 1
S.	12	8 4	11 42	14 7	—	—	0 18	12 3	1 2	12 11	6 44	10 2	7 29	10 6
S.	13	9 3	0 22	15 3	0 59	16 1	1 47	12 10	2 28	13 9	8 11	10 11	8 50	11 4
M.	14	10 2	1 30	17 0	1 58	18 0	3 7	13 9	3 40	14 11	9 22	11 10	9 53	12 3
Tu.	15	11 0	2 24	18 11	2 47	19 9	4 10	14 9	4 37	15 10	10 19	12 8	10 43	13 3
W.	16	11 55	3 10	20 5	3 33	20 10	5 4	15 6	5 29	16 6	11 6	13 3	11 29	13 4
Th.	17	0 50	3 56	21 1	4 18	21 2	5 54	16 1	6 18	16 10	11 52	13 8	—	—
F.	18	1 43	4 39	21 1	5 1	20 10	6 41	16 4	7 0	16 8	0 15	13 8	0 38	13 7
S.	19	2 35	5 21	20 5	5 40	20 0	7 20	16 1	7 40	16 2	1 1	13 6	1 22	13 4
S.	20	3 26	6 0	19 5	6 20	18 8	7 58	15 7	8 17	15 4	1 42	13 1	2 2	12 12
M.	21	4 17	6 39	17 10	6 59	16 11	8 35	14 10	8 53	14 4	2 21	12 6	2 40	12 1
Tu.	22	5 8	7 22	16 0	7 46	15 0	9 11	13 10	9 31	13 4	3 0	11 9	3 21	11 3
W.	23	5 58	8 12	14 2	8 39	13 6	9 52	13 1	10 16	12 3	3 44	10 10	4 9	10 5
Th.	24	6 47	9 14	13 0	9 56	12 9	10 43	12 2	11 14	11 6	4 35	10 0	5 8	9 5
F.	25	7 35	10 39	12 8	11 20	12 9	11 53	11 10	—	—	5 48	9 6	6 28	9 5
S.	26	8 21	12 0	13 1	—	—	0 34	11 4	1 15	12 1	7 8	9 6	7 47	9 4
S.	27	9 7	0 36	13 7	1 7	14 2	1 52	11 10	2 28	12 10	8 25	10 1	8 58	10 5
M.	28	9 51	1 34	14 10	1 54	15 6	3 1	12 6	3 29	13 7	9 26	10 9	9 48	11 1
Tu.	29	10 35	2 13	16 2	2 30	16 10	3 53	13 3	4 15	14 3	10 8	11 4	10 26	11 8
W.	30	11 18	2 47	17 6	3 3	18 0	4 36	13 11	4 55	14 9	10 43	11 11	10 59	12 1
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full - - - - -							1	11	8.17	9	17	N.12	17	0
Last Quarter							2	7	50	10	18	48	18	4
New - - - - -							3	4	3	11	19	19	19	9
First Quarter							4	0	4	12	18	37	20	12
							5	3	N.58	13	16	40	21	15
In Perigee - -							6	7	54	14	13	35	22	17
In Apogee - -							7	11	32	15	9	34	23	19
							8	14	42	16	4	57	24	19

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, — f. :
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

BRITISH AND IRISH PORTS.

SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.			
	1	10 40 17 3	10 58 17 6	0 14 14 9	0 32 15 0	1 45 17 4	2 2 17 8	14						
	2	11 16 17 9	11 34 18 0	0 49 15 3	1 6 15 5	2 18 17 11	2 36 18 2	15						
	3	11 51 18 2	— —	1 22 15 7	1 37 15 9	2 51 18 5	3 6 18 8	16						
	4	0 8 18 3	0 25 18 4	1 53 15 9	2 8 15 10	3 22 18 9	3 37 18 10	17						
	5	0 43 18 4	1 0 18 3	2 23 15 10	2 38 15 9	3 53 18 11	4 7 18 11	18						
	6	1 16 18 3	1 33 18 1	2 53 15 9	3 8 15 8	4 24 18 11	4 39 18 10	19						
	7	1 51 17 11	2 11 17 8	3 24 15 6	3 41 15 4	4 55 18 8	5 10 18 6	20						
	8	2 31 17 3	2 51 16 11	4 0 15 1	4 19 14 9	5 28 18 3	5 48 17 11	21						
	9	3 11 16 5	3 33 16 0	4 39 14 6	5 1 14 2	6 8 17 8	6 31 17 3	22						
	10	3 58 15 6	4 26 15 1	5 25 13 10	5 54 13 6	6 55 16 11	7 23 16 7	23						
	11	4 58 14 8	5 33 14 7	6 29 13 3	7 9 13 1	7 56 16 4	8 37 16 1	24						
	12	6 12 14 9	6 55 15 2	7 52 13 2	8 36 13 5	9 20 16 0	10 3 16 1	25						
	13	7 37 15 9	8 15 16 6	9 20 13 10	9 59 14 3	10 47 16 4	11 28 16 9	26						
	14	8 46 17 2	9 16 17 11	10 34 14 9	11 4 15 3	— —	0 3 17 3	27						
	15	9 43 18 7	10 9 19 2	11 31 15 8	11 56 16 2	0 33 17 9	0 59 18 4	28						
	16	10 34 19 8	11 0 20 0	— —	0 20 16 7	1 26 18 11	1 50 19 5	29						
	17	11 25 20 3	11 49 20 4	0 43 16 11	1 6 17 2	2 13 19 10	2 35 20 2	30						
	18	— —	0 12 20 4	1 28 17 3	1 49 17 3	2 57 20 4	3 20 20 6	31						
	19	0 36 20 2	0 59 19 11	2 10 17 2	2 31 17 0	3 42 20 5	4 2 20 4	32						
	20	1 20 19 6	1 41 19 2	2 52 16 10	3 11 16 6	4 22 20 1	4 42 19 10	33						
	21	2 1 18 8	2 21 17 11	3 30 16 2	3 50 15 9	5 2 19 5	5 22 19 0	34						
Tu.	22	2 41 17 3	3 2 16 7	4 10 15 3	4 30 14 9	5 41 18 6	6 1 18 0	35						
W.	23	3 25 15 10	3 49 15 2	4 52 14 3	5 17 13 9	6 24 17 5	6 49 16 10	36						
Th.	24	4 13 14 6	4 44 13 11	5 46 13 3	6 17 12 11	7 17 16 4	7 49 15 11	37						
F.	25	5 20 13 7	5 56 13 6	6 54 12 7	7 38 12 6	8 23 15 6	9 3 15 3	38						
S.	26	6 34 13 8	7 13 14 0	8 20 12 6	8 59 12 9	9 46 15 2	10 27 15 3	39						
S.	27	7 51 14 5	8 23 14 11	9 38 13 0	10 13 13 4	11 7 15 5	11 41 15 8	40						
M.	28	8 49 15 5	9 11 15 11	10 43 13 8	11 8 14 0	— —	0 9 16 0	41						
Tu.	29	9 31 16 5	9 50 16 11	11 28 14 4	11 46 14 8	0 33 16 5	0 54 16 10	42						
W.	30	10 9 17 4	10 27 17 9	— —	0 3 15 0	1 14 17 3	1 33 17 6	43						
Half Mean Spring } Range.		9ft. 4in.		8ft. 0in.		9ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	0	17		9	2	56		17	5	44		25	8	30	
2	0	36		10	3	17		18	6	5		26	8	51	
3	0	55		11	3	38		19	6	26		27	9	11	
4	1	15		12	3	58		20	6	47		28	9	31	
5	1	35		13	4	19		21	7	8		29	9	50	
6	1	55		14	4	40		22	7	28		30	10	10	
7	2	15		15	5	1		23	7	49					
8	2	35		16	5	23		24	8	10					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

DOVER subtract 5 m.

SHERNESS subtract 3 m.

LONDON 0 m.

E 2

SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.					
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.		
			Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.	
Tu.	1	11 25 4	11 45	11 0	—	—	6 1	19 2	6 19	19 5	2 57	13 0	3 14	13 3						
W.	2	morn.	0 2	11 1	0 19	11 2	6 36	19 8	6 52	19 11	3 29	13 5	3 44	13 8						
Th.	3	0 38	0 34	11 3	0 49	11 4	7 8	20 2	7 24	20 4	4 0	13 11	4 15	14 0						
F.	4	1 21	1 5	11 4	1 22	11 4	7 40	20 5	7 56	20 6	4 30	14 1	4 46	14 2						
S.	5	2 4	1 38	11 4	1 54	11 3	8 12	20 6	8 28	20 5	5 2	14 1	5 18	13 11						
S.	6	2 49	2 10	11 2	2 25	11 1	8 43	20 3	8 59	20 0	5 33	13 9	5 50	13 7						
M.	7	3 35	2 42	11 0	2 59	10 11	9 17	19 8	9 36	19 4	6 7	13 4	6 28	13 1						
Tu.	8	4 23	3 18	10 9	3 36	10 7	9 54	18 11	10 15	18 6	6 49	12 10	7 11	12 1						
W.	9	5 14	3 55	10 5	4 16	10 3	10 37	18 0	11 4	17 6	7 34	12 2	7 58	11 10						
Th.	10	6 8	4 39	10 1	5 6	9 11	11 36	17 1	—	—	8 26	11 6	9 0	11 3						
F.	11	7 5	5 37	9 10	6 15	9 9	0 14	16 8	0 53	16 5	9 40	11 1	10 21	11 1						
S.	12	8 4	7 0	9 9	7 44	9 11	1 31	16 5	2 10	16 9	11 2	11 3	11 42	11 7						
S.	13	9 3	8 27	10 2	9 7	10 5	2 49	17 3	3 27	18 1	—	—	0 19	13 4						
M.	14	10 2	9 42	10 9	10 14	11 1	4 3	18 10	4 33	19 7	0 53	12 8	1 24	13 3						
Tu.	15	11 0	10 42	11 5	11 8	11 9	5 0	20 4	5 25	21 0	1 54	13 9	2 20	14 9						
W.	16	11 55	11 32	12 0	11 56	12 2	5 49	21 7	6 13	22 0	2 43	14 8	3 6	15 1						
Th.	17	oa 50	—	—	0 19	12 4	6 37	22 5	7 0	22 7	3 29	15 5	3 51	15 7						
F.	18	1 43	0 41	12 4	1 3	12 4	7 22	22 8	7 44	22 7	4 12	15 9	4 33	15 3						
S.	19	2 35	1 25	12 3	1 47	12 1	8 5	22 5	8 26	22 1	4 55	15 6	5 16	15 2						
S.	20	3 26	2 8	11 11	2 28	11 9	8 46	21 8	9 6	21 1	5 36	14 9	5 57	14 4						
M.	21	4 17	2 48	11 6	3 8	11 3	9 26	20 5	9 45	19 8	6 18	13 10	6 39	13 4						
Tu.	22	5 8	3 27	10 11	3 46	10 7	10 5	18 11	10 28	18 2	7 1	12 10	7 24	12 3						
W.	23	5 58	4 7	10 4	4 30	10 0	10 56	17 5	11 28	16 8	7 49	11 9	8 17	11 3						
Th.	24	6 47	4 57	9 9	5 25	9 6	—	—	0 1	16 1	8 47	10 10	9 25	10 0						
F.	25	7 35	6 0	9 4	6 43	9 4	0 38	15 7	1 16	15 5	10 7	10 5	10 46	10 4						
S.	26	8 21	7 28	9 4	8 7	9 5	1 54	15 4	2 31	15 7	11 24	10 5	11 59	10 9						
S.	27	9 7	8 45	9 7	9 20	9 10	3 7	16 1	3 41	16 8	—	—	0 32	11 1						
M.	28	9 51	9 50	10 1	10 17	10 4	4 12	17 2	4 37	17 9	1 2	11 5	1 27	11 13						
Tu.	29	10 35	10 39	10 6	10 57	10 9	4 57	18 3	5 14	18 9	1 49	12 3	2 9	12 7						
W.	30	11 18	11 15	11 0	11 33	11 2	5 31	19 2	5 49	19 7	2 27	12 11	2 45	13 3						
Half Mean Spring } Range.			5ft. 9in.						10ft. 5in.						7ft. 2in.					
Phases of the Moon.										Moon's Declination at Noon.										
D. H. M.										M.D. ° ' "										
Full - - - - - 2 3 57 Morning.										1 11 8. 17 9 17 N. 12 17 0 N. 5 25 18 42										
Last Quarter - 9 10 4 Afternoon.										2 7 50 10 18 48 18 4 8. 42 26 17 14										
New - - - - - 16 1 19 Afternoon.										3 4 3 11 19 19 19 9 6 27 15 3										
First Quarter - 23 3 22 Afternoon.										4 0 4 12 18 37 20 12 52 28 12 12										
In Perigee - - 15 8 0 Morning.										5 3 N. 58 13 16 40 21 15 51 29 8										
In Apogee - - 27 1 0 Afternoon.										6 7 54 14 13 35 22 17 56 30 5										
										7 11 32 15 9 34 23 19 7										
										8 14 42 16 4 57 24 19 21										

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required.—for
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.	
Th.	1	10 44 18 0	11 2 18 3	0 20 15 3	0 36 15 6	1 50 17 11	2 6 18 3	0					0	
F.	2	11 19 18 6	11 36 18 7	0 53 15 9	1 8 15 11	2 21 18 7	2 38 18 9	15.9						
Sa.	3	11 54 18 8	— —	1 23 16 0	1 39 16 1	2 54 18 11	3 10 19 2	16.9						
Su.	4	0 12 18 9	0 30 18 9	1 54 16 2	2 10 16 1	3 24 19 3	3 39 19 3	17.9						
Mo.	5	0 49 18 8	1 7 18 6	2 26 16 1	2 42 16 0	3 57 19 3	4 13 19 2	18.9						
Tu.	6	1 26 18 3	1 46 18 0	2 58 15 10	3 16 15 7	4 29 19 0	4 48 18 9	19.9						
We.	7	2 6 17 7	2 28 17 2	3 35 15 4	3 54 15 0	5 6 18 6	5 25 18 3	20.9						
Th.	8	2 50 16 9	3 13 16 3	4 16 14 8	4 39 14 4	5 47 17 11	6 10 17 6	21.9						
F.	9	3 39 15 8	4 8 15 2	5 6 14 0	5 35 13 8	6 37 17 1	7 6 16 9	22.9						
Sa.	10	4 40 14 9	5 17 14 7	6 9 13 4	6 50 13 2	7 38 16 5	8 17 16 2	23.9						
Su.	11	5 59 14 9	6 43 15 3	7 37 13 2	8 23 13 5	9 3 16 1	9 49 16 1	24.9						
Mo.	12	7 25 15 10	8 0 16 6	9 8 13 10	9 47 14 3	10 33 16 5	11 13 16 9	25.9						
Tu.	13	8 29 17 3	8 57 17 11	10 19 14 9	10 48 15 3	11 47 17 3	— —	26.9						
We.	14	9 23 18 6	9 48 19 1	11 13 15 8	11 36 16 2	0 15 17 9	0 42 18 4	27.9						
Th.	15	10 12 19 6	10 36 19 9	11 59 16 6	— —	1 7 18 10	1 29 19 3	28.9						
F.	16	11 1 20 0	11 24 20 0	0 22 16 9	0 44 17 0	1 52 19 8	2 14 19 11	0.5						
Sa.	17	11 46 20 0	— —	1 6 17 1	1 27 17 1	2 35 20 1	2 56 20 2	1.5						
Su.	18	0 8 19 10	0 30 19 7	1 47 16 11	2 6 16 10	3 18 20 2	3 36 20 1	2.5						
Mo.	19	0 52 19 3	1 12 18 9	2 25 16 8	2 44 16 4	3 56 19 10	4 16 19 7	3.5						
Tu.	20	1 32 18 4	1 52 17 10	3 2 16 0	3 21 15 7	4 34 19 2	4 53 18 10	4.5						
We.	21	2 13 17 2	2 34 16 6	3 41 15 2	4 1 14 8	5 12 18 4	5 33 17 10	5.5						
Th.	22	2 56 15 11	3 18 15 3	4 23 14 3	4 46 13 10	5 54 17 4	6 17 16 11	6.5						
F.	23	3 42 14 8	4 8 14 2	5 11 13 4	5 39 12 11	6 41 16 5	7 6 16 0	7.5						
Sa.	24	4 38 13 9	5 12 13 6	6 12 12 8	6 49 12 6	7 38 15 7	8 17 15 4	8.5						
Su.	25	5 50 13 6	6 27 13 9	7 31 12 5	8 13 12 6	8 58 15 3	9 39 15 2	9.5						
Mo.	26	7 4 14 2	7 39 14 7	8 52 12 9	9 28 13 1	10 18 15 4	10 54 15 6	10.5						
Tu.	27	8 9 15 2	8 33 15 8	10 1 13 5	10 29 13 10	11 29 15 10	11 57 16 3	11.5						
We.	28	8 53 16 2	9 12 16 8	10 5 14 2	11 10 14 6	— —	0 21 16 7	12.5						
Th.	29	9 32 17 1	9 51 17 6	11 27 14 10	11 45 15 2	0 39 17 0	0 58 17 4	13.5						
F.	30	10 10 17 10	10 28 18 2	— —	0 2 15 5	1 17 17 9	1 33 18 1	14.5						
Sa.	31	10 46 18 5	11 6 18 7	0 19 15 8	0 36 15 10	1 50 18 5	2 7 18 8	0						
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	29		9	12	50		17	14	40		25	15	52	
2	10	48		10	13	5		18	14	51		26	15	58	
3	11	7		11	13	21		19	15	2		27	16	4	
4	11	25		12	13	35		20	15	12		28	16	8	
5	11	43		13	13	49		21	15	21		29	16	12	
6	12	0		14	14	3		22	15	30		30	16	15	
7	12	17		15	14	16		23	15	38		31	16	17	
8	12	34		16	14	28		24	15	46					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for

DOVER subtract 5 m.		SHEWENESS subtract 8 m.		LONDON 0 m.
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SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Tu.	1	11 12 54	11 37	9 1	11 55	9 3	10 50	24 0	11 7	24 4	5 42	19 2	5 59	19 6
W.	2	morn.	—	—	0 12	9 4	11 24	24 9	11 40	25 1	6 15	19 10	6 31	20 2
Th.	3	0 38	0 28	9 5	0 44	9 6	11 56	25 3	—	—	6 47	20 5	7 2	20 6
F.	4	1 21	1 1	9 7	1 18	9 7	0 12	25 5	0 28	25 6	7 18	20 7	7 34	20 6
S.	5	2 4	1 34	9 7	1 49	9 7	0 45	25 6	1 0	25 4	7 50	20 5	8 5	20 4
♄.	6	2 49	2 4	9 7	2 20	9 7	1 15	25 2	1 31	24 10	8 22	20 1	8 39	19 9
M.	7	3 35	2 37	9 6	2 55	9 4	1 47	24 6	2 6	24 0	8 57	19 4	9 15	18 11
Tu.	8	4 23	3 13	9 3	3 32	9 2	2 24	23 6	2 43	23 0	9 34	18 5	9 53	17 11
W.	9	5 14	3 53	9 0	4 15	8 10	3 4	22 5	3 27	21 9	10 13	17 5	10 36	16 9
Th.	10	6 8	4 41	8 8	5 12	8 6	3 54	21 1	4 28	20 7	11 2	16 2	11 34	15 12
F.	11	7 5	5 49	8 4	6 28	8 3	5 8	20 3	5 53	20 3	—	—	0 10	15 9
S.	12	8 4	7 10	8 3	7 54	8 5	6 39	20 7	7 23	21 3	0 52	15 10	1 42	16 3
♄.	13	9 3	8 34	8 8	9 12	8 11	8 3	22 0	8 38	23 0	2 26	17 0	3 6	17 11
M.	14	10 2	9 43	9 2	10 13	9 5	9 6	24 0	9 33	25 0	3 40	18 11	4 13	19 10
Tu.	15	11 0	10 40	9 8	11 6	9 10	9 58	25 11	10 21	26 8	4 43	20 9	5 10	21 6
W.	16	11 55	11 31	10 0	11 56	10 2	10 44	27 3	11 8	27 10	5 36	22 1	6 0	22 8
Th.	17	0 50	—	—	0 20	10 4	11 31	28 2	11 54	28 4	6 23	22 11	6 45	23 1
F.	18	1 43	0 43	10 4	1 5	10 4	—	—	0 16	28 3	7 7	23 0	7 28	22 9
S.	19	2 35	1 27	10 4	1 48	10 3	0 38	28 0	0 59	27 7	7 48	22 4	8 8	21 12
♄.	20	3 26	2 8	10 1	2 27	9 11	1 18	27 0	1 37	26 3	8 28	21 3	8 48	20 7
M.	21	4 17	2 46	9 9	3 4	9 6	1 56	25 5	2 15	24 5	9 7	19 9	9 25	18 11
Tu.	22	5 8	3 23	9 3	3 44	9 0	2 34	23 6	2 55	22 7	9 44	18 0	10 5	17 3
W.	23	5 58	4 7	8 10	4 33	8 7	3 18	21 7	3 46	20 8	10 27	16 4	10 50	15 6
Th.	24	6 47	5 1	8 4	5 34	8 1	4 16	19 9	4 53	19 2	11 20	14 10	11 56	14 6
F.	25	7 35	6 14	7 11	6 54	7 10	5 37	18 11	6 23	18 11	—	—	0 35	14 5
S.	26	8 21	7 33	7 11	8 11	8 0	7 3	19 2	7 41	19 7	1 18	14 6	2 1	14 10
♄.	27	9 7	8 48	8 2	9 20	8 4	8 17	20 3	8 46	20 10	2 41	15 5	3 15	16 0
M.	28	9 51	9 47	8 6	10 9	8 8	9 10	21 7	9 30	22 3	3 43	16 9	4 7	17 5
Tu.	29	10 35	10 28	8 10	10 47	9 0	9 48	23 0	10 4	23 7	4 29	18 1	4 50	18 8
W.	30	11 18	11 6	9 2	11 24	9 3	10 21	24 1	10 38	24 7	5 10	19 3	5 29	19 9

Half Mean Spring } 4^{ft.} 10^{in.}
Range.

13^{ft.} 0^{in.}

10^{ft.} 6^{in.}

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - -	2	3	57	Morning.
Last Quarter -	9	10	4	Afternoon.
New - - - -	16	1	19	Afternoon.
First Quarter	23	3	22	Afternoon.
In Perigee - -	15	8	0	Morning.
In Apogee - -	27	1	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	11	S. 17	9	17	N. 12	17	0	N. 5	25	18	S. 42
2	7	50	10	18	48	18	4	S. 42	26	17	14
3	4	3	11	19	19	19	9	6	27	15	2
4	0	4	12	18	37	20	12	52	28	13	1-
5	3	N. 58	13	16	40	21	15	51	29	8	50
6	7	54	14	13	35	22	17	56	30	5	4
7	11	32	15	9	34	23	19	7			
8	14	42	16	4	57	24	19	21			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
Fr.	1	6 23 34	2	6 41 34	9	9 45 14	10	10 1 15	1	10 42 10	3	10 58 10	5	14.3
W.	2	6 58 35	3	7 15 35	9	10 16 15	3	10 30 15	5	11 13 10	7	11 28 10	8	○
Th.	3	7 31 36	3	7 46 36	5	10 44 15	7	10 58 15	8	11 43 10	9	12 0 10	9	16.3
F.	4	8 2 36	7	8 17 36	7	11 13 15	8	11 30 15	7	—	—	0 17 10	9	17.3
S.	5	8 32 36	6	8 46 36	5	11 46 15	6	—	—	0 34 10	8	0 50 10	7	18.3
M.	6	9 1 36	1	9 17 35	8	0 2 15	5	0 20 15	3	1 6 10	6	1 23 10	5	19.3
Th.	7	9 34 35	0	9 50 34	3	0 39 15	1	1 0 14	9	1 41 10	3	2 0 10	1	20.3
Fr.	8	10 6 33	6	10 23 32	7	1 21 14	5	1 42 14	2	2 21 9	11	2 42 9	9	21.3
W.	9	10 40 31	7	11 3 30	7	2 5 13	10	2 30 13	6	3 4 9	7	3 28 9	5	○
Th.	10	11 32 29	9	—	—	2 59 13	1	3 36 12	10	3 58 9	2	4 34 9	0	23.3
F.	11	0 9 29	2	0 47 29	0	4 17 12	8	5 1 12	9	5 12 8	11	5 51 8	11	24.3
S.	12	1 30 29	3	2 16 29	11	5 43 12	11	6 23 13	4	6 30 9	1	7 10 9	4	25.3
M.	13	2 59 30	11	3 41 32	3	7 0 13	9	7 33 14	3	7 48 9	7	8 24 9	11	26.3
Th.	14	4 18 33	9	4 54 35	3	8 2 14	10	8 29 15	5	8 56 10	2	9 27 10	6	27.3
Fr.	15	5 24 36	9	5 51 38	0	8 53 16	0	9 16 16	6	9 52 10	10	10 13 11	2	28.3
W.	16	6 17 39	0	6 42 39	9	9 38 16	10	10 1 17	2	10 35 11	5	10 58 11	7	●
Th.	17	7 6 40	3	7 28 40	8	10 22 17	4	10 41 17	5	11 20 11	9	11 42 11	9	0.9
F.	18	7 50 40	6	8 11 40	2	11 1 17	4	11 23 17	2	—	—	0 4 11	8	1.9
S.	19	8 31 39	8	8 50 39	0	11 45 16	11	—	—	0 26 11	6	0 48 11	4	2.9
M.	20	9 8 38	1	9 25 37	0	0 6 16	7	0 28 16	2	1 9 11	2	1 30 10	11	3.9
Th.	21	9 42 35	8	9 57 34	4	0 49 15	8	1 11 15	0	1 50 10	7	2 11 10	3	4.9
Fr.	22	10 13 32	10	10 32 31	4	1 33 14	6	1 56 13	11	2 32 10	0	2 55 9	8	5.9
W.	23	10 55 29	11	11 21 28	8	2 21 13	4	2 51 12	10	3 20 9	4	3 50 9	0	○
Th.	24	11 54 27	7	—	—	3 23 12	4	4 2 12	0	4 22 8	9	4 58 8	6	7.9
F.	25	0 33 27	0	1 14 26	10	4 46 11	11	5 26 11	11	5 37 8	5	6 14 8	6	8.9
S.	26	1 54 27	0	2 34 27	6	6 4 12	1	6 40 12	3	6 51 8	7	7 27 8	9	9.9
M.	27	3 14 28	3	3 50 29	2	7 13 12	7	7 42 12	11	8 1 9	0	8 32 9	2	10.9
Th.	28	4 21 30	2	4 47 31	4	8 7 13	4	8 26 13	10	8 59 9	5	9 22 9	8	11.9
Fr.	29	5 11 32	5	5 31 33	5	8 44 14	2	9 0 14	7	9 42 9	10	9 59 10	1	12.9
W.	30	5 51 34	4	6 10 35	1	9 16 14	11	9 32 15	3	10 15 10	3	10 30 10	6	13.9
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	0 17		9	2 56		17	5 44		25	8 30	
2	0 36		10	3 17		18	6 5		26	8 51	
3	0 55		11	3 38		19	6 26		27	9 11	
4	1 15		12	3 58		20	6 47		28	9 31	
5	1 35		13	4 19		21	7 8		29	9 50	
6	1 55		14	4 40		22	7 28		30	10 10	
7	2 15		15	5 1		23	7 49				
8	2 35		16	5 23		24	8 10				

the times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
Tu.	1	11 25 54	10 21	9 1	10 37	9 2	7 34	7 1	7 51	7 2	4 47	10 4	5 4	10 6
W.	2	morn.	10 52	9 2	11 7	9 3	8 6	7 4	8 20	7 5	5 20	10 8	5 36	10 10
Th.	3	0 38	11 22	9 3	11 36	9 3	8 35	7 6	8 48	7 6	5 52	10 11	6 6	10 11
F.	4	1 21	11 51	9 3	—	—	9 3	7 5	9 18	7 5	6 21	10 11	6 38	10 13
S.	5	2 4	0 10	9 3	0 26	9 3	9 33	7 4	9 47	7 3	6 55	10 9	7 11	10 7
S.	6	2 49	0 42	9 3	0 59	9 2	10 2	7 1	10 19	7 0	7 27	10 5	7 44	10 2
M.	7	3 35	1 17	9 2	1 39	9 1	10 38	6 10	10 59	6 7	8 2	9 11	8 22	9 8
Tu.	8	4 23	2 1	8 11	2 24	8 9	11 24	6 5	11 52	6 2	8 43	9 5	9 7	9 1
W.	9	5 14	2 47	8 7	3 12	8 6	—	—	0 24	5 11	9 35	8 10	10 7	8 7
Th.	10	6 8	3 41	8 4	4 15	8 3	1 1	5 9	1 44	5 8	10 45	8 6	11 25	8 3
F.	11	7 5	4 53	8 2	5 32	8 1	2 29	5 8	3 10	5 10	—	—	0 5	8 3
S.	12	8 4	6 12	8 1	6 55	8 2	3 48	6 1	4 24	6 4	0 46	8 7	1 28	8 13
S.	13	9 3	7 34	8 4	8 7	8 7	4 54	6 7	5 21	6 10	2 6	9 2	2 39	9 7
M.	14	10 2	8 36	8 11	9 3	9 2	5 47	7 2	6 13	7 5	3 6	10 1	3 32	10 7
Tu.	15	11 0	9 28	9 5	9 51	9 8	6 38	7 9	7 3	8 0	3 55	11 1	4 18	11 4
W.	16	11 55	10 14	9 10	10 37	9 11	7 28	8 2	7 51	8 4	4 41	11 10	5 5	12 1
Th.	17	0 25 50	10 59	9 11	11 19	9 11	8 12	8 6	8 32	8 6	5 28	12 3	5 49	12 3
F.	18	1 43	11 40	9 11	—	—	8 52	8 5	9 12	8 3	6 10	12 2	6 32	12 0
S.	19	2 35	0 2	9 10	0 24	9 9	9 32	8 1	9 50	7 10	6 53	11 9	7 13	11 4
S.	20	3 26	0 45	9 8	1 6	9 6	10 9	7 7	10 29	7 3	7 33	11 0	7 52	10 7
M.	21	4 17	1 28	9 4	1 50	9 2	10 50	6 11	11 14	6 7	8 12	10 1	8 33	9 8
Tu.	22	5 8	2 13	8 11	2 38	8 8	11 43	6 2	—	—	8 58	9 2	9 27	8 9
W.	23	5 58	3 4	8 5	3 33	8 3	0 16	5 10	0 52	5 7	9 59	8 5	10 32	8 1
Th.	24	6 47	4 3	8 1	4 39	7 11	1 30	5 5	2 14	5 3	11 11	7 11	11 51	7 10
F.	25	7 35	5 18	7 10	5 56	7 9	2 56	5 4	3 33	5 6	—	—	0 30	7 13
S.	26	8 21	6 35	7 9	7 13	7 10	4 7	5 8	4 38	5 10	1 9	7 11	1 46	8 1
S.	27	9 7	7 42	7 11	8 16	8 1	5 6	6 0	5 30	6 2	2 20	8 4	2 48	8 8
M.	28	9 51	8 40	8 4	9 0	8 7	5 51	6 4	6 10	6 7	3 11	9 0	3 29	9 4
Tu.	29	10 35	9 18	8 9	9 35	8 11	6 28	6 9	6 46	6 11	3 46	9 8	4 2	10 0
W.	30	11 18	9 52	9 1	10 8	9 2	7 4	7 1	7 21	7 3	4 18	10 4	4 34	10 7
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Full - - - - -	2	3	57	Morning.	1	11	S. 17		9	17	N. 12		17	0	N. 5		25	18	S. 42
Last Quarter -	9	10	4	Afternoon.	2	7	50		10	18	48		18	4	S. 42		26	17	14
New - - - - -	16	1	19	Afternoon.	3	4	3		11	19	19		19	9	6		27	15	2
First Quarter	23	3	22	Afternoon.	4	0	4		12	18	37		20	12	52		28	12	12
					5	3	N. 58		13	16	40		21	15	51		29	8	50
In Perigee - -	15	8	0	Morning.	6	7	54		14	13	35		22	17	56		30	5	0
In Apogee - -	27	1	0	Afternoon.	7	11	32		15	9	34		23	19	7				
					8	14	42		16	4	57		24	19	21				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 3m. | LONDONDERRY add 4m. | SLIGO BAY add 9m.

SEPTEMBER, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.												
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.														
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.															
1	4	7	13	4	4	24	13	8	4	30	10	10	4	47	11	0	4	53	11	6	5	10	11	8	14.3	
2	4	39	13	11	4	54	14	2	5	4	11	2	5	21	11	4	5	16	11	10	5	41	11	11	0	
3	5	10	14	4	5	26	14	5	5	37	11	5	5	53	11	6	5	57	12	1	6	14	12	2	16.3	
4	5	43	14	6	6	0	14	5	6	10	11	6	6	26	11	6	6	30	12	3	6	47	12	3	17.3	
5	6	16	14	4	6	31	14	3	6	42	11	6	6	57	11	5	7	3	12	3	7	18	12	3	18.3	
6	6	48	14	1	7	6	13	10	7	13	11	3	7	30	11	1	7	34	12	2	7	51	12	0	19.3	
7	7	25	13	6	7	46	13	2	7	48	10	11	8	6	10	8	8	8	11	10	8	25	11	8	20.3	
8	8	7	12	9	8	29	12	1	8	24	10	6	8	43	10	2	8	42	11	5	9	0	11	2	21.3	
9	8	53	11	10	9	20	11	5	9	5	9	11	9	29	9	8	9	19	10	11	9	44	10	8	22.3	
10	9	54	11	1	10	34	10	11	9	57	9	5	10	33	9	3	10	17	10	4	10	54	10	1	23.3	
11	11	16	11	0	11	58	11	2	11	13	9	2	11	56	9	3	11	32	10	0	—	—	—	—	24.3	
12	—	—	—	—	0	40	11	7	—	—	—	—	0	40	9	6	0	11	10	0	0	51	10	3	25.3	
13	1	17	12	1	1	50	12	8	1	23	9	10	2	2	10	3	1	31	10	7	2	12	11	0	26.3	
14	2	20	13	4	2	49	13	11	2	35	10	8	3	7	11	1	2	48	11	6	3	23	11	11	27.3	
15	3	15	14	7	3	38	15	1	3	34	11	7	3	59	12	0	3	53	12	4	4	20	12	9	28.3	
16	4	1	15	7	4	24	16	0	4	24	12	4	4	48	12	7	4	46	13	0	5	11	13	2	29.3	
17	4	46	16	3	5	8	16	5	5	12	12	9	5	35	12	10	5	34	13	4	5	55	13	6	0.9	
18	5	30	16	4	5	52	16	2	5	57	12	9	6	19	12	8	6	17	13	5	6	40	13	4	1.9	
19	6	14	15	10	6	34	15	5	6	40	12	6	7	0	12	3	7	1	13	2	7	21	13	0	2.9	
20	6	55	15	0	7	15	14	5	7	20	11	11	7	39	11	6	7	40	12	9	7	58	12	6	3.9	
21	7	36	13	10	7	57	13	2	7	57	11	1	8	14	10	8	8	16	12	1	8	34	11	8	4.9	
22	8	20	12	5	8	45	11	8	8	34	10	3	8	57	9	10	8	51	11	3	9	11	10	10	5.9	
23	9	12	11	1	9	42	10	7	9	20	9	5	9	45	9	0	9	36	10	5	10	4	10	0	6.9	
24	10	20	10	2	11	1	10	1	10	18	8	9	10	59	8	7	10	40	9	7	11	18	9	5	7.9	
25	11	42	10	1	—	—	—	—	11	40	8	6	—	—	—	—	11	55	9	4	—	—	—	—	—	8.9
26	0	21	10	2	0	58	10	6	0	19	8	7	0	58	8	9	0	32	9	4	1	9	9	6	9.9	
27	1	31	10	10	1	59	11	3	1	37	9	0	2	11	9	3	1	46	9	9	2	21	10	0	10.9	
28	2	23	11	8	2	44	12	2	2	39	9	7	3	1	9	11	2	51	10	4	3	16	10	8	11.9	
29	3	3	12	7	3	21	13	0	3	22	10	3	3	41	10	6	3	40	11	11	4	0	11	4	12.9	
30	3	38	13	5	3	55	13	9	4	0	10	10	4	17	11	1	4	20	11	7	4	39	11	10	13.9	
Half Mean Spring		7ft. 4in.				5ft. 10in.				6ft. 2in.																

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
2 56		17	5 44		25	8 30	
3 17		18	6 5		26	8 51	
3 38		19	6 26		27	9 11	
3 58		20	6 47		28	9 31	
4 19		21	7 8		29	9 50	
4 40		22	7 28		30	10 10	
5 1		23	7 49				
5 23		24	8 10				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.	
Th.	1	morn.	3 20 18 4		3 36 18 7		5 13 14 6		5 30 15 3		11 15 12 3		11 31 12 5	
F.	2	0 2	3 51 18 10		4 7 19 0		5 47 15 0		6 3 15 6		11 47 12 7		—	
S.	3	0 47	4 23 19 1		4 39 19 2		6 20 15 2		6 37 15 6		0 3 12 7		0 20 12 8	
S.	4	1 33	4 55 19 1		5 12 18 11		6 52 15 2		7 7 15 2		0 38 12 8		0 55 12 7	
M.	5	2 21	5 28 18 8		5 46 18 5		7 23 14 11		7 40 14 9		1 12 12 6		1 29 12 5	
Tu.	6	3 11	6 5 18 0		6 24 17 5		7 58 14 6		8 16 14 3		1 47 12 4		2 6 12 1	
W.	7	4 4	6 45 16 10		7 9 16 2		8 33 14 1		8 52 13 8		2 26 11 11		2 46 11 8	
Th.	8	4 59	7 34 15 6		8 1 14 10		9 16 13 7		9 42 13 0		3 8 11 5		3 32 11 1	
F.	9	5 55	8 33 14 4		9 10 14 0		10 10 13 1		10 43 12 5		3 58 10 9		4 29 10 6	
S.	10	6 53	9 54 14 0		10 42 14 2		11 21 12 9		—		5 4 10 3		5 46 10 1	
S.	11	7 50	11 30 14 8		—		0 5 12 3		0 50 13 1		6 31 10 2		7 17 10 6	
M.	12	8 46	0 10 15 4		0 44 16 2		1 36 12 11		2 17 13 11		7 59 10 11		8 35 11 5	
Tu.	13	9 41	1 14 17 1		1 40 18 0		2 53 13 10		3 24 14 11		9 6 11 10		9 34 12 3	
W.	14	10 35	2 4 18 10		2 27 19 7		3 53 14 9		4 20 15 10		9 59 12 8		10 22 13 0	
Th.	15	11 28	2 49 20 2		3 11 20 6		4 45 15 6		5 9 16 4		10 45 13 3		11 7 13 4	
F.	16	0 20	3 33 20 9		3 55 20 9		5 32 16 1		5 55 16 7		11 29 13 6		11 51 13 6	
S.	17	1 12	4 15 20 8		4 35 20 5		6 16 16 3		6 36 16 5		—		0 12 13 5	
S.	18	2 5	4 55 20 1		5 14 19 7		6 53 16 0		7 11 15 9		0 34 13 3		0 55 13 1	
M.	19	2 57	5 32 19 0		5 51 18 5		7 30 15 6		7 47 15 1		1 15 12 11		1 34 12 8	
Tu.	20	3 48	6 11 17 8		6 31 16 10		8 5 14 9		8 22 14 2		1 52 12 4		2 12 13 0	
W.	21	4 39	6 53 16 0		7 16 15 3		8 39 13 11		8 57 13 2		2 32 11 8		2 53 11 3	
Th.	22	5 28	7 39 14 4		8 4 13 7		9 17 13 1		9 38 12 1		3 15 10 11		3 37 10 6	
F.	23	6 16	8 34 13 1		9 9 12 9		10 3 12 3		10 33 11 4		4 1 10 2		4 30 9 10	
S.	24	7 2	9 49 12 7		10 32 12 8		11 7 11 9		11 47 11 1		5 3 9 7		5 41 9 5	
S.	25	7 47	11 13 12 11		11 51 13 4		—		0 27 11 11		6 21 9 5		7 1 9 7	
M.	26	8 31	—		0 24 13 10		1 7 11 7		1 46 12 6		7 38 9 10		8 13 10 1	
Tu.	27	9 14	0 54 14 5		1 17 15 1		2 19 12 3		2 48 13 3		8 44 10 7		9 9 10 11	
W.	28	9 58	1 36 15 10		1 54 16 5		3 15 13 1		3 39 14 1		9 30 11 3		9 49 11 6	
Th.	29	10 42	2 13 17 1		2 30 17 8		4 1 13 11		4 22 14 9		10 8 11 9		10 26 12 5	
F.	30	11 28	2 47 18 2		3 4 18 7		4 42 14 7		5 0 15 3		10 43 12 2		11 0 12 5	
S.	31	morn.	3 20 18 11		3 38 19 1		5 18 15 2		5 35 15 6		11 16 12 7		11 33 12 8	
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	1	7	58	Afternoon.	1	1	S. 6	9	19	N. 6	17	11	S. 28	25	13	S. 15
Last Quarter -	9	6	13	Morning.	2	3	N. 0	10	17	33	18	14	53	26	10	
New - - - - -	15	11	1	Afternoon.	3	7	2	11	14	53	19	17	26	27	6	25
First Quarter -	23	9	42	Morning.	4	10	50	12	11	16	20	19	0	28	2	27
Full - - - - -	31	11	5	Morning.	5	14	10	13	6	56	21	19	35	29	1	N. 42
					6	16	51	14	2	10	22	19	13	30	5	51
In Perigee - -	13	11	0	Morning.	7	18	40	15	2	S. 42	23	17	59	31	9	50
In Apogee - -	25	6	0	Morning.	8	19	28	16	7	20	24	15	59			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required.—
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
Th.	1	10 44 18 0		11 2 18 3		0 20 15 3		0 36 15 6		1 50 17 11		2 6 18 3		0
F.	2	11 19 18 6		11 36 18 7		0 53 15 9		1 8 15 11		2 21 18 7		2 38 18 9		15.9
S.	3	11 54 18 8		— —		1 23 16 0		1 39 16 1		2 54 18 11		3 10 19 2		16.9
S.	4	0 12 18 9		0 30 18 9		1 54 16 2		2 10 16 1		3 24 19 3		3 39 19 3		17.9
M.	5	0 49 18 8		1 7 18 6		2 26 16 1		2 42 16 0		3 57 19 3		4 13 19 2		18.9
Tu.	6	1 26 18 3		1 46 18 0		2 58 15 10		3 16 15 7		4 29 19 0		4 48 18 9		19.9
W.	7	2 6 17 7		2 28 17 2		3 35 15 4		3 54 15 0		5 6 18 6		5 25 18 3		20.9
Th.	8	2 50 16 9		3 13 16 3		4 16 14 8		4 39 14 4		5 47 17 11		6 10 17 6		21.9
F.	9	3 39 15 8		4 8 15 2		5 6 14 0		5 35 13 8		6 37 17 1		7 6 16 9		22.9
S.	10	4 40 14 9		5 17 14 7		6 9 13 4		6 50 13 2		7 38 16 5		8 17 16 2		23.9
S.	11	5 59 14 9		6 43 15 3		7 37 13 2		8 23 13 5		9 3 16 1		9 49 16 1		24.9
M.	12	7 25 15 10		8 0 16 6		9 8 13 10		9 47 14 3		10 33 16 5		11 13 16 9		25.9
Tu.	13	8 29 17 3		8 57 17 11		10 19 14 9		10 48 15 3		11 47 17 3		— —		26.9
W.	14	9 23 18 6		9 48 19 1		11 13 15 8		11 36 16 2		0 15 17 9		0 42 18 4		27.9
Th.	15	10 12 19 6		10 36 19 9		11 59 16 6		— —		1 7 18 10		1 29 19 3		28.9
F.	16	11 1 20 0		11 24 20 0		0 22 16 9		0 44 17 0		1 52 19 8		2 14 19 11		0.5
S.	17	11 46 20 0		— —		1 6 17 1		1 27 17 1		2 35 20 1		2 56 20 2		1.5
S.	18	0 8 19 10		0 30 19 7		1 47 16 11		2 6 16 10		3 18 20 2		3 36 20 1		2.5
M.	19	0 52 19 3		1 12 18 9		2 25 16 8		2 44 16 4		3 56 19 10		4 16 19 7		3.5
Tu.	20	1 32 18 4		1 52 17 10		3 2 16 0		3 21 15 7		4 34 19 2		4 53 18 10		4.5
W.	21	2 13 17 2		2 34 16 6		3 41 15 2		4 1 14 8		5 12 18 4		5 33 17 10		5.5
Th.	22	2 56 15 11		3 18 15 3		4 23 14 3		4 46 13 10		5 54 17 4		6 17 16 11		6.5
F.	23	3 42 14 8		4 8 14 2		5 11 13 4		5 39 12 11		6 41 16 5		7 6 16 0		7.5
S.	24	4 38 13 9		5 12 13 6		6 12 12 8		6 49 12 6		7 38 15 7		8 17 15 4		8.5
S.	25	5 50 13 6		6 27 13 9		7 31 12 5		8 13 12 6		8 58 15 3		9 39 15 2		9.5
M.	26	7 4 14 2		7 39 14 7		8 52 12 9		9 28 13 10		10 18 15 4		10 54 15 6		10.5
Tu.	27	8 9 15 2		8 33 15 8		10 1 13 5		10 29 13 10		11 29 15 10		11 57 16 3		11.5
W.	28	8 53 16 2		9 12 16 8		10 51 14 2		11 10 14 6		— —		0 21 16 7		12.5
Th.	29	9 32 17 1		9 51 17 6		11 27 14 10		11 45 15 2		0 39 17 0		0 58 17 4		13.5
F.	30	10 10 17 10		10 28 18 2		— —		0 2 15 5		1 17 17 9		1 33 18 1		14.5
S.	31	10 46 18 5		11 6 18 7		0 19 15 8		0 36 15 10		1 50 18 5		2 7 18 8		0
Half Mean Spring } Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
1	10 29		9	12 50		17	14 40		25	15 52	
2	10 48		10	13 5		18	14 51		26	15 58	
3	11 7		11	13 21		19	15 2		27	16 4	
4	11 25		12	13 35		20	15 12		28	16 8	
5	11 43		13	13 49		21	15 21		29	16 12	
6	12 0		14	14 3		22	15 30		30	16 15	
7	12 17		15	14 16		23	15 38		31	16 17	
8	12 34		16	14 28		24	15 46				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Th.	1	morn.	11 50	11 4	—	—	6 6	19 11	6 23	20 2	3 1	13 7	3 16	13 10
F.	2	0 2	0 6	11 5	0 21	11 6	6 39	20 5	6 54	20 8	3 31	14 0	3 46	14 3
S.	3	0 47	0 36	11 7	0 51	11 7	7 10	20 10	7 27	20 11	4 1	14 5	4 17	14 6
Th.	4	1 33	1 8	11 7	1 25	11 6	7 44	20 11	8 0	20 11	4 33	14 5	4 49	14 4
M.	5	2 21	1 41	11 5	1 58	11 4	8 16	20 9	8 33	20 6	5 6	14 2	5 23	14 6
Tu.	6	3 11	2 16	11 3	2 34	11 1	8 51	20 2	9 10	19 9	5 42	13 9	6 2	13 5
W.	7	4 4	2 53	10 11	3 12	10 9	9 30	19 3	9 51	18 9	6 23	13 1	6 46	12 9
Th.	8	4 59	3 32	10 7	3 55	10 4	10 15	18 3	10 43	17 9	7 11	12 5	7 38	12 6
F.	9	5 55	4 19	10 2	4 47	10 0	11 16	17 3	11 54	16 10	8 7	11 8	8 41	11 4
S.	10	6 53	5 19	9 10	5 57	9 9	—	—	0 34	16 6	9 21	11 2	10 5	11 1
Th.	11	7 50	6 43	9 10	7 31	9 11	1 15	16 6	1 57	16 9	10 49	11 3	11 31	11 6
M.	12	8 46	8 15	10 2	8 54	10 6	2 37	17 4	3 15	18 1	—	—	0 7	12 3
Tu.	13	9 41	9 27	10 10	9 57	11 2	3 48	18 11	4 17	19 8	0 38	12 8	1 7	13 5
W.	14	10 35	10 24	11 5	10 48	11 9	4 42	20 4	5 5	20 0	1 35	13 9	2 0	14 5
Th.	15	11 28	11 12	12 0	11 35	12 2	5 28	21 6	5 51	21 10	2 24	14 7	2 47	14 11
F.	16	0 20	11 57	12 3	—	—	6 14	22 1	6 37	22 4	3 7	15 2	3 28	15 4
S.	17	1 12	0 18	12 3	0 39	12 3	6 58	22 4	7 19	22 3	3 49	15 5	4 9	15 7
Th.	18	2 5	1 0	12 2	1 21	12 0	7 39	22 1	7 59	21 10	4 29	15 3	4 49	15 6
M.	19	2 57	1 41	11 10	2 1	11 7	8 19	21 4	8 38	20 9	5 9	14 7	5 28	14 5
Tu.	20	3 48	2 20	11 4	2 39	11 1	8 57	20 2	9 17	19 6	5 48	13 9	6 8	13 5
W.	21	4 39	2 59	10 10	3 19	10 7	9 37	18 9	9 59	18 1	6 30	12 9	6 55	12 5
Th.	22	5 28	3 39	10 3	4 1	10 0	10 23	17 6	10 51	16 10	7 19	11 10	7 44	11 4
F.	23	6 16	4 25	9 9	4 50	9 7	11 22	16 2	11 57	15 9	8 11	10 11	8 43	10 7
S.	24	7 2	5 20	9 5	5 55	9 4	—	—	0 33	15 5	9 20	10 4	10 0	10 3
Th.	25	7 47	6 38	9 3	7 21	9 4	1 10	15 3	1 48	15 4	10 40	10 3	11 17	10 6
M.	26	8 31	8 0	9 6	8 35	9 8	2 23	15 9	2 57	16 3	11 49	10 10	—	—
Tu.	27	9 14	9 8	9 11	9 37	10 2	3 29	16 10	3 58	17 5	0 20	11 3	0 48	11 8
W.	28	9 58	10 0	10 5	10 21	10 8	4 20	18 0	4 39	18 6	1 10	12 0	1 31	12 5
Th.	29	10 42	10 39	10 10	10 57	11 1	4 56	19 0	5 14	19 5	1 50	12 9	2 9	13 5
F.	30	11 28	11 15	11 3	11 32	11 5	5 31	19 10	5 48	20 2	2 27	13 5	2 44	13 8
S.	31	morn.	11 50	11 6	—	—	6 6	20 5	6 23	20 8	3 0	13 11	3 15	14 2
Half Mean Spring Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.			

Phases of the Moon.

	D.	H.	M.	
Full - - -	1	7	58	Afternoon.
Last Quarter	9	6	13	Morning.
New - - -	15	11	1	Afternoon.
First Quarter	23	9	42	Morning.
Full - - -	31	11	5	Morning.
In Perigee -	13	11	0	Morning.
In Apogee -	25	6	0	Morning.

Moon's Declination at Noon.

M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'
1	18	6	9	19	N. 6	17	11	8. 28	25	13	8. 15
2	3	N. 0	10	17	33	18	14	53	26	10	5
3	7	2	11	14	53	19	17	26	27	6	3
4	10	50	12	11	16	20	19	0	28	2	3
5	14	10	13	6	56	21	19	35	29	15	4
6	16	51	14	2	10	22	19	13	30	5	1
7	18	40	15	28	42	23	17	59	31	9	1
8	19	28	16	7	20	24	15	59			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 2 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	D.								
Th.	1	3	1	12	6	3	17	12	9	1	59	15	6	2	15	15	10	8	3	12	10	8	18	13	0	○
F.	2	3	32	12	11	3	47	13	1	2	30	16	0	2	44	16	2	8	32	13	2	8	46	13	3	15.9
S.	3	4	2	13	3	4	18	13	3	2	58	16	3	3	14	16	3	9	2	13	3	9	20	13	3	16.9
S.	4	4	35	13	2	4	52	13	1	3	31	16	3	3	47	16	1	9	36	13	1	9	54	12	11	17.9
M.	5	5	9	12	11	5	27	12	9	4	4	15	11	4	22	15	9	10	12	12	9	10	31	12	5	18.9
Tu.	6	5	46	12	7	6	6	12	4	4	41	15	7	5	0	15	3	10	51	12	1	11	13	11	9	19.9
W.	7	6	26	12	0	6	48	11	8	5	21	14	11	5	44	14	7	11	36	11	4	—	—	—	—	20.9
Th.	8	7	13	11	4	7	42	10	11	6	10	14	1	6	37	13	8	0	1	11	0	0	29	10	7	21.9
F.	9	8	13	10	6	8	50	10	2	7	8	13	3	7	44	12	11	0	59	10	2	1	35	9	11	☾
S.	10	9	33	10	0	10	17	10	1	8	25	12	9	9	11	12	9	2	17	9	8	3	5	9	7	23.9
S.	11	11	1	10	3	11	44	10	8	9	56	12	11	10	37	13	3	3	54	9	9	4	38	10	0	24.9
M.	12	—	—	—	—	0	21	11	1	11	14	13	9	11	45	14	3	5	16	10	4	5	46	11	0	25.9
Tu.	13	0	50	11	7	1	17	12	1	—	—	—	—	0	11	14	11	6	12	11	8	6	34	12	4	26.9
W.	14	1	41	12	6	2	4	13	1	0	35	15	6	0	59	16	2	6	55	13	0	7	14	13	7	27.9
Th.	15	2	26	13	6	2	46	13	10	1	22	16	8	1	44	17	0	7	33	14	0	7	54	14	4	●
F.	16	3	7	14	1	3	29	14	3	2	6	17	4	2	27	17	6	8	14	14	5	8	34	14	5	0.5
S.	17	3	50	14	3	4	10	14	3	2	46	17	6	3	6	17	5	8	55	14	4	9	16	14	1	1.5
S.	18	4	31	14	0	4	52	13	8	3	27	17	2	3	47	16	10	9	37	13	10	9	57	13	5	2.5
M.	19	5	12	13	4	5	32	13	0	4	7	16	5	4	27	16	0	10	17	12	11	10	37	12	5	3.5
Tu.	20	5	52	12	7	6	12	12	2	4	46	15	7	5	7	15	1	10	58	11	11	11	21	11	4	4.5
W.	21	6	33	11	8	6	56	11	2	5	29	14	7	5	53	14	0	11	44	10	10	—	—	—	—	5.5
Th.	22	7	21	10	9	7	49	10	2	6	18	13	6	6	44	12	11	0	9	10	4	0	35	9	10	6.5
F.	23	8	18	9	8	8	53	9	5	7	13	12	5	7	47	12	1	1	4	9	4	1	38	9	0	☽
S.	24	9	32	9	3	10	12	9	3	8	24	11	10	9	6	11	9	2	16	8	10	3	0	8	8	8.5
S.	25	10	52	9	4	11	30	9	6	9	47	11	10	10	23	12	1	3	45	8	8	4	23	8	10	9.5
M.	26	—	—	—	—	0	3	9	10	10	56	12	4	11	27	12	8	4	58	9	0	5	29	9	4	10.5
Tu.	27	0	34	10	2	1	0	10	6	11	54	13	1	—	—	—	—	5	56	9	10	6	17	10	3	11.5
W.	28	1	21	10	10	1	38	11	3	0	15	13	6	0	32	14	0	6	33	10	10	6	47	11	4	12.5
Th.	29	1	55	11	7	2	12	12	0	0	49	14	6	1	7	14	11	7	2	11	10	7	17	12	3	13.5
F.	30	2	29	12	4	2	45	12	7	1	25	15	4	1	42	15	8	7	32	12	8	7	47	13	0	14.5
S.	31	3	1	12	10	3	17	13	1	1	59	15	11	2	15	16	2	8	3	13	2	8	20	13	4	○
Half Mean Spring Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	29	Add.	9	12	50	Add.	17	14	40	Add.	25	15	52	Add.
2	10	48		10	13	5		18	14	51		26	15	58	
3	11	7		11	13	21		19	15	2		27	16	4	
4	11	25		12	13	35		20	15	12		28	16	8	
5	11	43		13	13	49		21	15	21		29	16	12	
6	12	0		14	14	3		22	15	30		30	16	15	
7	12	17		15	14	16		23	15	38		31	16	17	
8	12	34		16	14	28		24	15	46					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Th.	1	morn.	11 42	9 5	11 59	9 6	10 54	25 0	11 10	25 4	5 46	20 1	6 22	0 3
F.	2	0 2	—	—	0 14	9 7	11 26	25 9	11 42	25 11	6 17	20 9	6 33	20 11
S.	3	0 47	0 30	9 8	0 47	9 9	11 58	26 0	—	—	6 49	21 1	7 52	21 1
S.	4	1 33	1 4	9 9	1 21	9 9	0 15	26 1	0 32	26 0	7 21	21 0	7 38	20 10
M.	5	2 21	1 38	9 9	1 55	9 8	0 49	25 10	1 6	25 6	7 55	20 7	8 14	20 8
Tu.	6	3 11	2 13	9 7	2 31	9 6	1 23	25 1	1 41	24 7	8 33	19 10	8 52	19 4
W.	7	4 4	2 50	9 4	3 10	9 3	2 0	24 0	2 20	23 5	9 11	18 10	9 32	18 3
Th.	8	4 59	3 32	9 1	3 56	8 11	2 43	22 9	3 7	22 1	9 54	17 8	10 19	17 0
F.	9	5 55	4 23	8 9	4 54	8 7	3 35	21 4	4 9	20 9	10 45	16 4	11 16	15 11
S.	10	6 53	5 30	8 5	6 12	8 4	4 49	20 4	5 36	20 3	11 54	15 9	—	—
S.	11	7 50	6 57	8 4	7 42	8 6	6 26	20 8	7 11	21 3	0 39	15 11	1 29	16 4
M.	12	8 46	8 22	8 9	8 57	9 0	7 51	22 2	8 22	23 1	2 14	17 1	2 51	18 0
Tu.	13	9 41	9 27	9 3	9 55	9 5	8 50	24 1	9 15	25 0	3 23	19 0	3 54	19 10
W.	14	10 35	10 20	9 8	10 45	9 10	9 38	25 11	10 1	26 7	4 22	20 8	4 49	21 4
Th.	15	11 28	11 10	9 11	11 34	10 11	10 24	27 1	10 46	27 6	5 14	21 11	5 38	22 3
F.	16	0 20	11 56	10 2	—	—	11 9	27 9	11 30	27 10	6 0	22 7	6 21	22 3
S.	17	1 12	0 18	10 3	0 40	10 3	11 51	27 10	—	—	6 42	22 7	7 22	22 3
S.	18	2 5	1 1	10 2	1 21	10 1	0 11	27 7	0 31	27 2	7 22	22 0	7 41	21 6
M.	19	2 57	1 40	10 0	1 59	9 10	0 51	26 8	1 10	25 10	8 0	20 11	8 19	20 4
Tu.	20	3 48	2 18	9 8	2 37	9 5	1 28	25 1	1 47	24 3	8 39	19 7	8 58	18 9
W.	21	4 39	2 56	9 2	3 16	9 0	2 7	23 4	2 27	22 6	9 17	18 0	9 37	17 4
Th.	22	5 28	3 38	8 10	4 1	8 7	2 49	21 9	3 12	20 9	9 58	16 6	10 20	15 9
F.	23	6 16	4 26	8 4	4 55	8 2	3 39	20 0	4 11	19 4	10 44	15 1	11 14	14 7
S.	24	7 2	5 29	8 0	6 7	7 11	4 48	18 11	5 31	18 9	11 49	14 5	—	—
S.	25	7 47	6 47	7 10	7 26	7 11	6 16	18 11	6 56	19 3	0 28	14 4	1 11	14 7
M.	26	8 31	8 3	8 1	8 36	8 3	7 31	19 10	8 5	20 5	1 52	15 0	2 28	15 7
Tu.	27	9 14	9 6	8 5	9 30	8 7	8 32	21 2	8 54	21 11	3 1	16 3	3 26	17 3
W.	28	9 58	9 51	8 10	10 10	9 0	9 12	22 8	9 29	23 3	3 49	17 8	4 10	18 4
Th.	29	10 42	10 29	9 1	10 48	9 3	9 47	23 11	10 4	24 5	4 31	18 11	4 51	19 7
F.	30	11 28	11 7	9 4	11 25	9 5	10 21	24 10	10 38	25 3	5 11	19 11	5 30	20 4
S.	31	morn.	11 42	9 7	12 0	9 8	10 55	25 7	11 13	25 11	5 47	20 8	6 42	20 11
Half Mean Spring } Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	1	7	58	Afternoon.
Last Quarter - -	9	6	13	Morning.
New - - - - -	15	11	1	Afternoon.
First Quarter - -	23	9	42	Morning.
Full - - - - -	31	11	5	Morning.
<hr/>				
In Perigee - - -	13	11	0	Morning.
In Apogee - - -	25	6	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	6	9	19	N. 6	17	11	S. 28	25	13	S. 18
2	3	N. 0	10	17	33	18	14	53	26	10	5
3	7	2	11	14	53	19	17	26	27	6	23
4	10	50	12	11	16	20	19	0	28	2	27
5	14	10	13	6	56	21	19	35	29	18	42
6	16	51	14	2	10	22	19	13	30	5	31
7	18	40	15	2	S. 42	23	17	59	31	9	30
8	19	28	16	7	20	24	15	59			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—At
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age AT NOON.																																														
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	D.																																																						
Th.	1	6 28 35 8	6 45 36 2	9 48 15 6	10 3 15 8	10 45 10 8	11 0 10 10	○	F.	2	7 1 36 9	7 17 37 2	10 17 15 10	10 30 16 0	11 14 10 11	11 29 10 11	15.9	S.	3	7 33 37 4	7 49 37 5	10 45 16 0	11 1 16 0	11 46 10 11	—	—	16.9																																													
S.	4	8 5 37 4	8 21 37 2	11 17 15 11	11 35 15 10	0 3 10 11	0 20 10 10	17.9	M.	5	8 37 36 10	8 54 36 5	11 53 15 8	—	—	0 38 10 9	0 56 10 8	18.9	Tu.	6	9 11 35 10	9 28 35 0	0 12 15 5	0 33 15 1	1 15 10 6	1 35 10 4	19.9	W.	7	9 45 34 1	10 3 33 2	0 55 14 9	1 18 14 5	1 55 10 1	2 18 9 11	20.9	Th.	8	10 23 32 1	10 46 31 0	1 43 14 0	2 10 13 8	2 42 9 8	3 9 9 6	21.9	F.	9	11 14 30 0	11 50 29 3	2 40 13 3	3 16 12 11	3 38 9 3	4 14 9 1	22.9	S.	10	—	0 31 29 0	3 58 12 9	4 44 12 9	4 54 8 11	5 35 8 11	23.9									
S.	11	1 17 29 3	2 4 30 0	5 29 13 0	6 11 13 4	6 17 9 1	6 58 9 4	24.9	M.	12	2 46 31 1	3 25 32 4	6 48 13 9	7 18 14 4	7 35 9 7	8 9 9 11	25.9	Tu.	13	4 1 33 10	4 34 35 3	7 46 14 11	8 11 15 5	8 39 10 3	9 8 10 6	26.9	W.	14	5 3 36 8	5 29 37 10	8 33 16 0	8 55 16 5	9 33 10 10	9 55 11 1	27.9	Th.	15	5 55 38 8	6 20 39 3	9 17 16 9	9 39 17 0	10 15 11 4	10 36 11 6	28.9	F.	16	6 43 39 8	7 5 39 10	9 59 17 1	10 19 17 2	10 57 11 7	11 17 11 7	0.5	S.	17	7 25 39 11	7 45 39 6	10 38 17 1	10 57 16 11	11 38 11 6	12 0 11 5	1.5										
S.	18	8 5 39 0	8 23 38 4	11 17 16 8	11 38 16 4	—	—	2.5	M.	19	8 41 37 5	8 58 36 6	11 58 15 11	—	—	0 41 11 0	1 1 10 9	3.5	Tu.	20	9 15 35 4	9 33 34 1	0 19 15 5	0 40 14 11	1 21 10 6	1 41 10 2	4.5	W.	21	9 50 32 9	10 7 31 7	1 3 14 4	1 26 13 10	2 9 9 11	2 27 9 7	5.5	Th.	22	10 25 30 3	10 47 28 11	1 50 13 5	2 16 12 11	2 49 9 4	3 14 9 1	6.5	F.	23	11 15 28 0	11 49 27 3	2 45 12 5	3 19 12 1	3 43 8 10	4 17 8 7	7.5	S.	24	—	0 26 26 10	3 57 11 11	4 39 11 10	4 53 8 5	5 30 8 5	8.5									
S.	25	1 7 26 10	1 47 27 2	5 20 11 11	5 57 12 2	6 8 8 6	6 44 8 8	9.5	M.	26	2 25 27 10	3 1 28 7	6 30 12 5	7 1 12 9	7 17 8 10	7 49 9 1	10.5	Tu.	27	3 35 29 7	4 3 30 7	7 28 13 2	7 50 13 7	8 19 9 3	8 42 9 6	11.5	W.	28	4 27 31 9	4 50 32 9	8 8 14 0	8 25 14 4	9 4 9 9	9 23 9 11	12.5	Th.	29	5 12 33 10	5 32 34 8	8 42 14 9	8 59 15 1	9 42 10 2	9 58 10 4	13.5	F.	30	5 52 35 5	6 11 36 1	9 15 15 4	9 32 15 7	10 13 10 7	10 29 10 9	14.5	S.	31	6 29 36 7	6 47 37 0	9 48 15 10	10 4 16 0	10 45 10 11	11 1 11 0	○										

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	29		9	12	50		17	14	40		25	15	52	
2	10	48		10	13	5		18	14	51		26	15	58	
3	11	7		11	13	21		19	15	2		27	16	4	
4	11	25		12	13	35		20	15	12		28	16	8	
5	11	43		13	13	49		21	15	21		29	16	12	
6	12	0		14	14	3		22	15	30		30	16	15	
7	12	17		15	14	16		23	15	38		31	16	17	
8	12	34		16	14	28		24	15	46					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. HOLYHEAD add 18 m. KINGSTOWN subtract 1 m. for Dublin Time

Half Mean Spring } Range.			4ft. 9in.	3ft. 10in.			5ft. 7in.								
Phases of the Moon.				Moon's Declination at Noon.											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	1	7	58	Afternoon.	1	15. 6	9	19N. 6	17	11 5. 28	25	13 5. 11			
Last Quarter-	9	6	13	Morning.	2	3N. 0	10	17 33	18	14 53	26	10			
New- - - - -	15	11	1	Afternoon.	3	7 2	11	14 53	19	17 26	27	6 2			
First Quarter	23	9	42	Morning.	4	10 50	12	11 16	20	19 0	28	2 2			
Full - - - - -	31	11	5	Morning.	5	14 10	13	6 56	21	19 35	29	1 54			
					6	16 51	14	2 10	22	19 13	30	5 5			
In Perigee- -	13	11	0	Morning.	7	18 40	15	22. 42	23	17 59	31	9			
In Apogee- -	25	6	0	Morning.	8	19 28	16	7 20	24	15 59					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 8 m.

OCTOBER, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
Th.	1	4	11	14	1	4	26	14	4	4	34	11	3	4	50	11	6	4	57	12	0	5	13	12	1	○
F.	2	4	40	14	7	4	56	14	9	5	6	11	8	5	23	11	9	5	28	12	3	5	43	12	4	15.9
S.	3	5	13	14	10	5	30	14	10	5	40	11	9	5	57	11	10	6	0	12	5	6	17	12	6	16.9
S.	4	5	47	14	10	6	4	14	8	6	13	11	9	6	30	11	8	6	34	12	6	6	52	12	5	17.9
M.	5	6	21	14	5	6	40	14	2	6	47	11	6	7	5	11	4	7	9	12	4	7	26	12	3	18.9
Tu.	6	7	0	13	10	7	21	13	6	7	24	11	2	7	43	10	11	7	44	12	1	8	2	11	10	19.9
W.	7	7	43	13	1	8	7	12	7	8	2	10	8	8	22	10	4	8	21	11	7	8	40	11	4	20.9
Th.	8	8	33	12	1	9	1	11	7	8	46	10	0	9	11	9	9	9	1	11	1	9	26	10	9	21.9
F.	9	9	35	11	2	10	15	11	0	9	39	9	6	10	14	9	3	9	58	10	5	10	36	10	2	○
S.	10	10	59	11	0	11	45	11	2	10	57	9	3	11	43	9	3	11	16	10	0	11	58	10	0	23.9
S.	11	—	—	—	—	0	28	11	7	—	—	—	—	0	28	9	6	—	—	—	—	0	39	10	3	24.9
M.	12	1	6	12	2	1	36	12	9	1	10	9	11	1	47	10	3	1	19	10	7	1	56	11	0	25.9
Tu.	13	2	3	13	4	2	30	14	0	2	19	10	8	2	48	11	1	2	31	11	6	3	3	11	11	26.9
W.	14	2	55	14	6	3	18	15	0	3	14	11	7	3	39	11	11	3	32	12	4	3	59	12	8	27.9
Th.	15	3	40	15	5	4	2	15	9	4	3	12	3	4	26	12	5	4	25	12	11	4	49	13	1	●
F.	16	4	23	16	0	4	44	16	1	4	49	12	7	5	11	12	7	5	11	13	2	5	31	13	3	0.5
S.	17	5	5	16	0	5	26	15	10	5	32	12	7	5	53	12	5	5	52	13	3	6	13	13	2	1.5
S.	18	5	47	15	7	6	7	15	2	6	13	12	3	6	33	12	1	6	34	13	0	6	54	12	10	2.5
M.	19	6	26	14	9	6	46	14	3	6	52	11	9	7	11	11	5	7	13	12	7	7	31	12	3	3.5
Tu.	20	7	6	13	8	7	28	13	1	7	30	11	0	7	49	10	7	7	49	11	11	8	7	11	7	4.5
W.	21	7	51	12	5	8	14	11	10	8	7	10	3	8	28	9	10	8	25	11	3	8	44	10	11	5.5
Th.	22	8	39	11	2	9	6	10	8	8	50	9	6	9	13	9	1	9	4	10	6	9	29	10	1	6.5
F.	23	9	37	10	2	10	14	10	0	9	39	8	10	10	13	8	8	10	0	9	9	10	35	9	6	○
S.	24	10	54	10	0	11	36	10	1	10	52	8	6	11	33	8	6	11	11	9	4	11	49	9	3	8.5
S.	25	—	—	—	—	0	14	10	3	—	—	—	—	0	12	8	8	—	—	—	—	0	25	9	5	9.5
M.	26	0	48	10	7	1	19	11	0	0	49	8	10	1	25	9	1	0	59	9	7	1	33	9	10	10.5
Tu.	27	1	46	11	6	2	7	11	11	1	57	9	5	2	22	9	9	2	6	10	2	2	33	10	6	11.5
W.	28	2	26	12	4	2	45	12	9	2	43	10	1	3	3	10	4	2	57	10	10	3	19	11	2	12.5
Th.	29	3	4	13	3	3	21	13	7	3	23	10	8	3	42	10	11	3	41	11	5	4	2	11	8	13.5
F.	30	3	38	13	11	3	55	14	3	4	0	11	2	4	18	11	5	4	22	11	11	4	41	12	1	14.5
S.	31	4	11	14	6	4	28	14	9	4	35	11	7	4	53	11	9	4	58	12	3	5	15	12	4	○

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	29		9	12	50		17	14	40		25	15	52	
2	10	48		10	13	5		18	14	51		26	15	58	
3	11	7		11	13	21		19	15	2		27	16	4	
4	11	25		12	13	35		20	15	12		28	16	8	
5	11	43		13	13	49		21	15	21		29	16	12	
6	12	0		14	14	3		22	15	30		30	16	15	
7	12	17		15	14	16		23	15	38		31	16	17	
8	12	34		16	14	28		24	15	46					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

NOVEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.			H. M.	F. I.		
S.	1	om 16	3 56	19 2			4 14	19 3			5 53	15 5			6 11	15 6			11 52	12 8						
M.	2	1 6	4 32	19 4			4 50	19 2			6 30	15 6			6 46	15 5			0 11	12 9			0 31	12 9		
Tu.	3	1 59	5 8	18 11			5 26	18 8			7 3	15 4			7 21	15 1			0 50	12 8			1 9	12 7		
W.	4	2 55	5 47	18 4			6 8	17 10			7 39	15 1			7 59	14 7			1 28	12 5			1 48	12 3		
Th.	5	3 51	6 31	17 3			6 55	16 7			8 20	14 7			8 42	13 11			2 9	12 1			2 31	11 12		
F.	6	4 48	7 23	16 0			7 52	15 4			9 6	14 1			9 31	13 3			2 55	11 7			3 21	11 4		
S.	7	5 45	8 25	14 10			9 1	14 6			9 59	13 6			10 34	12 8			3 50	11 0			4 21	10 9		
S.	8	6 40	9 42	14 6			10 27	14 7			11 11	13 1			11 54	12 5			4 56	10 6			5 34	10 3		
M.	9	7 34	11 10	14 11			11 49	15 6			—	—			0 37	13 3			6 16	10 5			6 58	10 7		
Tu.	10	8 26	—	—			0 23	16 1			1 21	12 11			1 58	13 11			7 36	10 11			8 12	11 4		
W.	11	9 17	0 53	16 9			1 20	17 6			2 34	13 10			3 4	14 9			8 44	11 9			9 12	12 5		
Th.	12	10 9	1 44	18 2			2 6	18 9			3 32	14 8			3 59	15 5			9 39	12 4			10 3	12 7		
F.	13	11 0	2 28	19 3			2 51	19 7			4 23	15 5			4 46	15 10			10 26	12 9			10 48	12 12		
S.	14	11 52	3 13	19 9			3 34	19 9			5 9	15 10			5 30	15 11			11 10	13 0			11 30	13 2		
S.	15	0a 44	3 55	19 8			4 15	19 6			5 51	15 11			6 12	15 10			11 51	12 11			—	—		
M.	16	1 37	4 33	19 3			4 52	18 11			6 32	15 8			6 48	15 5			0 12	12 10			0 32	12 8		
Tu.	17	2 29	5 11	18 5			5 30	17 11			7 4	15 4			7 21	14 10			0 52	12 6			1 12	12 4		
W.	18	3 19	5 49	17 5			6 8	16 10			7 39	14 9			7 57	14 0			1 30	12 1			1 49	11 10		
Th.	19	4 8	6 27	16 2			6 48	15 7			8 14	14 1			8 30	13 2			2 9	11 7			2 29	11 4		
F.	20	4 56	7 10	14 11			7 32	14 4			8 48	13 4			9 8	12 4			2 49	11 0			3 9	10 9		
S.	21	5 41	7 57	13 9			8 26	13 5			9 29	12 7			9 54	11 7			3 30	10 6			3 54	10 3		
S.	22	6 25	8 57	13 1			9 31	13 0			10 24	12 0			10 51	11 2			4 22	10 0			4 52	9 9		
M.	23	7 8	10 8	13 1			10 45	13 3			11 29	11 10			—	—			5 24	9 8			5 59	9 7		
Tu.	24	7 51	11 21	13 6			11 54	13 11			0 7	11 4			0 45	12 2			6 34	9 9			7 8	9 12		
W.	25	8 35	—	—			0 25	14 6			1 21	12 0			1 54	12 10			7 41	10 2			8 14	10 6		
Th.	26	9 20	0 50	15 0			1 14	15 8			2 26	12 10			2 53	13 8			8 41	10 10			9 6	11 2		
F.	27	10 7	1 35	16 3			1 55	16 11			3 18	13 9			3 42	14 4			9 29	11 5			9 50	11 9		
S.	28	10 57	2 15	17 6			2 33	18 0			4 5	14 5			4 27	14 10			10 10	12 0			10 29	12 2		
S.	29	11 49	2 52	18 6			3 12	18 10			4 48	15 0			5 8	15 3			10 49	12 4			11 9	12 6		
M.	30	morn.	3 32	19 1			3 52	19 3			5 28	15 5			5 48	15 6			11 28	12 8			11 48	12 9		

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	7	1	46	Afternoon.
New- - - - -	14	10	55	Morning.
First Quarter- -	22	6	46	Morning.
Full - - - - -	30	1	0	Morning.
In Perigee - -	9	2	0	Afternoon.
In Apogee - -	22	2	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	13	N.25	9	8	N.27	17	19	S.41	25	0	N.2
2	16	24	10	3	53	18	19	41	26	4	15
3	18	31	11	0	S.53	19	18	46	27	8	30
4	19	36	12	5	35	20	17	0	28	12	12
5	19	31	13	9	56	21	14	32	29	15	19
6	18	15	14	13	42	22	11	28	30	18	1
7	15	52	15	16	39	23	7	57			
8	12	32	16	18	40	24	4	4			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required.—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

NOVEMBER, 1868.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
S.	1	11 26 18 9	11 45 18 10	0 53 16 1	1 10 16 2	2 24 18 11	2 40 19 1	16.5						
M.	2	— — — —	0 5 18 11	1 28 16 2	1 46 16 2	2 57 19 2	3 14 19 3	17.5						
Tu.	3	0 25 18 10	0 46 18 8	2 3 16 2	2 21 16 1	3 32 19 4	3 51 19 3	18.5						
W.	4	1 6 18 6	1 27 18 3	2 38 16 0	2 56 15 10	4 8 19 2	4 28 19 0	19.5						
Th.	5	1 49 17 11	2 12 17 6	3 16 15 7	3 38 15 3	4 48 18 9	5 10 18 5	20.5						
F.	6	2 36 17 0	3 2 16 7	4 1 14 11	4 26 14 7	5 32 18 2	5 58 17 9	21.5						
S.	7	3 31 16 1	4 1 15 8	4 53 14 3	5 25 13 11	6 24 17 5	6 55 17 0	—						
S.	8	4 33 15 2	5 7 15 0	6 0 13 8	6 40 13 5	7 28 16 9	8 8 16 6	23.5						
M.	9	5 46 15 1	6 24 15 5	7 23 13 6	8 8 13 8	8 52 16 5	9 34 16 5	24.5						
Tu.	10	7 2 15 11	7 38 16 6	8 49 13 11	9 26 14 4	10 15 16 7	10 53 16 10	25.5						
W.	11	8 9 17 0	8 36 17 7	9 59 14 9	10 28 15 11	11 29 17 3	11 57 17 8	26.5						
Th.	12	9 2 18 0	9 26 18 5	10 54 15 6	11 17 15 10	— — — —	0 23 18 0	27.5						
F.	13	9 50 18 9	10 14 19 0	11 39 16 1	— — — —	0 49 18 5	1 12 18 9	28.5						
S.	14	10 38 19 2	11 1 19 2	0 1 16 4	0 24 16 5	1 33 19 1	1 55 19 3	—						
S.	15	11 23 19 1	11 45 19 0	0 46 16 6	1 6 16 7	2 16 19 5	2 35 19 6	1.0						
M.	16	— — — —	0 6 18 10	1 26 16 6	1 46 16 4	2 55 19 6	3 16 19 5	2.0						
Tu.	17	0 27 18 7	0 48 18 3	2 4 16 2	2 22 15 11	3 34 19 4	3 53 19 1	3.0						
W.	18	1 9 17 11	1 29 17 7	2 41 15 8	2 59 15 4	4 11 18 10	4 30 18 6	4.0						
Th.	19	1 49 17 2	2 9 16 8	3 18 15 1	3 38 14 9	4 49 18 3	5 8 17 10	5.0						
F.	20	2 30 16 2	2 50 15 9	3 58 14 4	4 19 14 0	5 28 17 6	5 49 17 1	6.0						
S.	21	3 11 15 3	3 35 14 10	4 40 13 8	5 4 13 4	6 11 16 9	6 34 16 4	7.0						
S.	22	4 1 14 5	4 29 14 1	5 30 13 1	6 2 12 10	6 58 16 1	7 28 15 10	—						
M.	23	4 58 13 11	5 30 13 11	6 36 12 8	7 12 12 8	8 2 15 7	8 40 15 6	9.0						
Tu.	24	6 2 14 0	6 35 14 3	7 50 12 9	8 26 12 11	9 17 15 6	9 51 15 7	10.0						
W.	25	7 8 14 8	7 40 15 2	9 0 13 2	9 31 13 6	10 25 15 9	10 57 15 11	11.0						
Th.	26	8 6 15 8	8 36 16 1	10 3 13 10	10 26 14 2	11 26 16 3	11 52 16 7	12.0						
F.	27	8 52 16 7	9 13 17 0	10 49 14 6	11 9 14 10	— — — —	0 17 16 11	13.0						
S.	28	9 34 17 5	9 55 17 10	11 28 15 1	11 47 15 4	0 38 17 3	0 57 17 8	14.0						
S.	29	10 16 18 1	10 38 18 5	— — — —	0 6 15 7	1 17 18 0	1 37 18 4	15.0						
M.	30	11 0 18 7	11 22 18 9	0 26 15 10	0 46 16 0	1 57 18 7	2 17 18 10	—						

Half Mean Spring } Range.	9ft. 4in.	8ft. 0in.	9ft. 7in.
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Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	16 18	Add.	9	16 0	Add.	17	14 46	Add.	25	12 40	Add.
2	16 19		10	15 53		18	14 33		26	12 21	
3	16 19		11	15 46		19	14 19		27	12 1	
4	16 18		12	15 39		20	14 5		28	11 41	
5	16 16		13	15 30		21	13 49		29	11 20	
6	16 13		14	15 20		22	13 33		30	10 58	
7	16 9		15	15 10		23	13 16				
8	16 5		16	14 58		24	12 59				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

NOVEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																									
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
S.	1	om 16	0 6	11 7	0 23	11 7	6 41	20 10	7 0	20 11	3 33	14 4	3 51	14 6																													
M.	2	1 6	0 41	11 8	0 59	11 7	7 18	21 0	7 36	21 1	4 8	14 7	4 26	14 7																													
Tu.	3	1 59	1 17	11 7	1 36	11 6	7 54	21 0	8 12	20 10	4 44	14 5	5 31	14 5																													
W.	4	2 55	1 55	11 4	2 13	11 3	8 31	20 6	8 52	20 1	5 22	14 0	5 43	13 8																													
Th.	5	3 51	2 34	11 1	2 56	10 11	9 14	19 7	9 37	19 2	6 6	13 4	6 31	13 0																													
F.	6	4 48	3 18	10 9	3 41	10 6	10 2	18 7	10 30	18 2	6 57	12 8	7 25	12 1																													
S.	7	5 45	4 7	10 4	4 38	10 2	11 5	17 8	11 45	17 3	7 57	11 11	8 32	11 8																													
S.	8	6 40	5 11	10 0	5 47	9 11	—	—	0 25	16 11	9 11	11 6	9 53	11 5																													
M.	9	7 34	6 30	10 0	7 16	10 1	1 4	16 11	1 43	17 11	10 35	11 6	11 13	11 9																													
Tu.	10	8 26	7 57	10 3	8 33	10 6	2 20	17 6	2 55	18 2	11 47	12 2	—	—																													
W.	11	9 17	9 6	10 9	9 36	11 0	3 28	18 10	3 57	19 5	0 18	12 8	0 47	13 1																													
Th.	12	10 9	10 4	11 3	10 28	11 6	4 23	20 0	4 45	20 6	1 14	13 6	1 40	13 15																													
F.	13	11 0	10 51	11 8	11 14	11 10	5 7	20 10	5 30	21 2	2 3	14 2	2 26	14 5																													
S.	14	11 52	11 37	11 11	11 59	11 11	5 53	21 4	6 16	21 5	2 49	14 7	3 9	14 8																													
S.	15	0 244	—	—	0 19	11 11	6 37	21 5	6 58	21 5	3 29	14 9	3 49	14 9																													
M.	16	1 37	0 39	11 10	1 0	11 9	7 19	21 3	7 38	21 0	4 9	14 8	4 27	14 6																													
Tu.	17	2 29	1 19	11 7	1 38	11 4	7 56	20 9	8 16	20 4	4 46	14 3	5 6	13 12																													
W.	18	3 19	1 58	11 2	2 17	10 11	8 35	19 10	8 54	19 4	5 25	13 6	5 45	13 2																													
Th.	19	4 8	2 36	10 9	2 56	10 6	9 14	18 9	9 33	18 3	6 6	12 9	6 28	12 4																													
F.	20	4 56	3 15	10 4	3 35	10 1	9 54	17 9	10 17	17 3	6 50	12 0	7 13	11 8																													
S.	21	5 41	3 55	9 11	4 17	9 9	10 42	16 9	11 12	16 4	7 36	11 3	8 2	11 8																													
S.	22	6 25	4 43	9 7	5 12	9 6	11 47	16 0	—	—	8 33	10 9	9 7	10 7																													
M.	23	7 8	5 43	9 5	6 18	9 5	0 21	15 9	0 54	15 8	9 43	10 6	10 18	10 7																													
Tu.	24	7 51	6 58	9 6	7 34	9 7	1 27	15 9	1 59	15 11	10 52	10 8	11 24	10 12																													
W.	25	8 35	8 8	9 9	8 38	9 11	2 30	16 4	3 0	16 10	11 53	11 3	—	—																													
Th.	26	9 20	9 9	10 2	9 34	10 5	3 29	17 5	3 54	17 11	0 21	11 7	0 45	12 6																													
F.	27	10 7	9 58	10 7	10 20	10 10	4 18	18 5	4 38	18 11	1 8	12 5	1 30	12 9																													
S.	28	10 57	10 39	11 0	10 59	11 3	4 57	19 4	5 16	19 9	1 51	13 1	2 11	13 6																													
S.	29	11 49	11 19	11 5	11 39	11 6	5 35	20 1	5 55	20 5	2 31	13 8	2 50	13 12																													
M.	30	morn.	11 59	11 7	—	—	6 16	20 8	6 36	20 10	3 9	14 1	3 28	14 6																													
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.																								
Phases of the Moon.																						Moon's Declination at Noon.																					
D. H. M.																						M.D. ° ' "																					
Last Quarter - 7 1 46 Afternoon.																						1 13 N. 25 9 8 N. 27 17 19 S. 41 25 0 N. 2																					
New - - - 14 10 55 Morning.																						2 16 24 10 3 53 18 19 41 26 4 15																					
First Quarter - 22 6 46 Morning.																						3 18 31 11 0 8. 53 19 18 46 27 8 20																					
Full - - - 30 1 0 Morning.																						4 19 36 12 5 35 20 17 0 28 12 10																					
In Perigee - 9 2 0 Afternoon.																						5 19 31 13 9 56 21 14 32 29 15 29																					
In Apogee - 22 2 0 Morning.																						6 18 15 14 13 42 22 11 28 30 18 1																					
																						7 15 52 15 16 39 23 7 57																					
																						8 12 32 16 18 40 24 4 4																					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required.—
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

NOVEMBER, 1868.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								U's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.									
S.	1	3 33	13 3	3 51	13 4	2 32	16 4	2 49	16 5	8 37	13 4	8 54	13 4	16.5												
M.	2	4 9	13 4	4 28	13 3	3 5	16 5	3 23	16 4	9 13	13 4	9 32	13 2	17.5												
Tu.	3	4 47	13 1	5 6	12 11	3 42	16 2	4 1	16 0	9 51	13 0	10 11	12 9	18.5												
W.	4	5 26	12 9	5 47	12 6	4 20	15 9	4 41	15 6	10 32	12 5	10 56	12 0	19.5												
Th.	5	6 9	12 3	6 33	11 11	5 4	15 2	5 29	14 10	11 21	11 8	11 47	11 3	20.5												
F.	6	6 59	11 7	7 29	11 2	5 55	14 5	6 24	14 0	—	—	0 16	10 10	21.5												
S.	7	8 3	10 9	8 41	10 6	6 57	13 7	7 35	13 4	0 49	10 6	1 26	10 3	—												
S.	8	9 23	10 4	10 5	10 4	8 15	13 1	8 59	13 0	2 7	10 0	2 52	10 0	23.5												
M.	9	10 47	10 6	11 26	10 10	9 42	13 3	10 19	13 6	3 40	10 1	4 20	10 3	24.5												
Tu.	10	—	—	0 1	11 2	10 54	13 10	11 25	14 3	4 56	10 6	5 27	10 11	25.5												
W.	11	0 31	11 7	0 58	11 11	11 52	14 8	—	—	5 54	11 5	6 17	12 0	26.5												
Th.	12	1 22	12 4	1 45	12 8	0 16	15 2	0 39	15 8	6 37	12 6	6 56	12 11	27.5												
F.	13	2 6	13 0	2 27	13 4	1 2	16 1	1 24	16 5	7 16	13 4	7 36	13 8	28.5												
S.	14	2 49	13 6	3 10	13 7	1 46	16 8	2 8	16 9	7 56	13 10	8 15	13 9	—												
S.	15	3 30	13 8	3 50	13 7	2 28	16 10	2 47	16 9	8 35	13 8	8 54	13 6	1.0												
M.	16	4 10	13 6	4 29	13 3	3 6	16 7	3 25	16 4	9 14	13 4	9 34	13 0	2.0												
Tu.	17	4 49	12 11	5 9	12 7	3 44	16 0	4 4	15 8	9 54	12 7	10 14	12 2	3.0												
W.	18	5 29	12 3	5 49	12 0	4 24	15 3	4 43	14 11	10 34	11 9	10 55	11 4	4.0												
Th.	19	6 9	11 8	6 29	11 3	5 4	14 6	5 26	14 1	11 17	10 11	11 40	10 6	5.0												
F.	20	6 51	10 11	7 15	10 7	5 48	13 8	6 11	13 3	—	—	0 3	10 1	6.0												
S.	21	7 40	10 2	8 9	9 10	6 36	12 11	7 4	12 7	0 27	9 9	0 54	9 6	7.0												
S.	22	8 43	9 7	9 19	9 5	7 37	12 3	8 11	12 1	1 28	9 3	2 3	9 1	—												
M.	23	9 55	9 5	10 30	9 6	8 48	12 0	9 24	12 2	2 40	9 0	3 21	9 0	9.0												
Tu.	24	11 4	9 9	11 37	10 0	9 58	12 4	10 30	12 6	3 57	9 1	4 31	9 3	10.0												
W.	25	—	—	0 6	10 3	10 59	12 9	11 27	13 2	5 1	9 5	5 30	9 10	11.0												
Th.	26	0 33	10 7	0 56	10 10	11 51	13 6	—	—	5 52	10 3	6 13	10 8	12.0												
F.	27	1 17	11 2	1 37	11 6	0 12	13 11	0 31	14 4	6 31	11 2	6 48	11 8	13.0												
S.	28	1 56	11 10	2 15	12 3	0 50	14 9	1 10	15 2	7 4	12 1	7 21	12 6	14.0												
S.	29	2 33	12 6	2 51	12 9	1 29	15 7	1 48	15 11	7 38	12 10	7 56	13 2	15.0												
M.	30	3 10	13 0	3 29	13 3	2 8	16 2	2 27	16 4	8 15	13 4	8 34	13 5	—												

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.
1	16	18		9	16	0		17	14	46		25	12	40	
2	16	19		10	15	53		18	14	33		26	12	21	
3	16	19		11	15	46		19	14	19		27	12	1	
4	16	18		12	15	39		20	14	5		28	11	41	
5	16	16		13	15	30		21	13	49		29	11	20	
6	16	13		14	15	20		22	13	33		30	10	58	
7	16	9		15	15	10		23	13	16					
8	16	5		16	14	58		24	12	59					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 11 m.

NOVEMBER, 1868.

Half Mean Spring } 4 ^{ft.} 10 ^{in.}				13 ^{ft.} 0 ^{in.}											
Range.															
Phases of the Moon.				Moon's Declina											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	7	1	46	Afternoon.	1	13	N. 25	9	8	N. 27	17	19	S. 41	25	0
New - - - -	14	10	55	Morning.	2	16	24	10	3	53	18	19	41	26	4
First Quarter -	22	6	46	Morning.	3	18	31	11	0	S. 53	19	18	46	27	8
Full - - - -	30	1	0	Morning.	4	19	36	12	5	35	20	17	0	28	12
					5	19	31	13	9	56	21	14	32	29	15
In Perigee - -	9	2	0	Afternoon.	6	18	15	14	13	42	22	11	28	30	18
In Apogee - -	22	2	0	Morning.	7	15	52	15	16	39	23	7	57		
					8	12	32	16	18	40	24	4	4		

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — or
 GREENOCK add 19 m. LIVERPOOL add 12 m. PLYMOUTH add 20 m.

NOVEMBER, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	
	1	7 6 37 4		7 24 37 7	10 21 16 1	10 37 16 1	11 19 11 0	11 37 11 0	16.5					
	2	7 42 37 8	8 0 37 6	10 54 16 1	11 12 16 0	11 56 11 0	—	—	17.5					
Tu.	3	8 17 37 3	8 35 36 11	11 31 15 10	11 51 15 8	0 16 10 11	0 35 10 9	18.5						
W.	4	8 54 36 4	9 13 35 7	—	0 14 15 5	0 55 10 8	1 16 10 6	19.5						
Th.	5	9 32 34 9	9 51 33 9	0 38 15 0	1 3 14 8	1 38 10 3	2 3 10 0	20.5						
F.	6	10 13 32 10	10 38 31 10	1 29 14 3	1 57 13 11	2 28 9 10	2 56 9 8	21.5						
S.	7	11 6 30 11	11 41 30 2	2 30 13 7	3 7 13 3	3 28 9 5	4 5 9 3	22.5						
	8	—	0 19 29 10	3 48 13 1	4 32 13 1	4 45 9 1	5 24 9 1	23.5						
M.	9	1 2 30 0	1 44 30 6	5 15 13 3	5 53 13 7	6 3 9 2	6 40 9 5	24.5						
Tu.	10	2 24 31 4	3 2 32 4	6 28 13 11	6 59 14 4	7 15 9 8	7 48 9 11	25.5						
W.	11	3 37 33 4	4 9 34 6	7 27 14 9	7 52 15 2	8 18 10 2	8 46 10 5	26.5						
Th.	12	4 39 35 7	5 6 36 6	8 15 15 7	8 36 15 11	9 13 10 7	9 35 10 9	27.5						
F.	13	5 32 37 3	5 58 37 9	8 57 16 2	9 20 16 4	9 56 10 11	10 17 11 1	28.5						
S.	14	6 22 38 0	6 44 38 1	9 42 16 5	10 1 16 5	10 38 11 2	10 58 11 3	29.5						
	15	7 5 38 1	7 25 38 0	10 20 16 5	10 37 16 3	11 18 11 2	11 38 11 1	30.5						
M.	16	7 43 37 7	8 1 37 1	10 55 16 1	11 14 15 10	11 58 10 11	—	—	31.5					
Tu.	17	8 19 36 5	8 37 35 8	11 35 15 6	11 55 15 2	0 17 10 9	0 38 10 7	32.5						
W.	18	8 55 34 11	9 13 34 0	—	0 16 14 9	0 58 10 4	1 18 10 1	33.5						
Th.	19	9 20 33 0	9 46 32 1	0 38 14 4	0 59 13 11	1 38 9 11	1 59 9 8	34.5						
F.	20	10 2 31 2	10 20 30 2	1 21 13 7	1 44 13 2	2 21 9 6	2 44 9 3	35.5						
S.	21	10 41 29 3	11 7 28 6	2 8 12 10	2 35 12 6	3 7 9 1	3 34 8 11	36.5						
	22	11 37 27 11	—	3 9 12 3	3 44 12 1	4 7 8 9	4 41 8 7	37.5						
M.	23	0 10 27 6	0 44 27 7	4 21 12 1	4 58 12 2	5 14 8 6	5 47 8 7	38.5						
Tu.	24	1 20 27 9	1 55 28 2	5 32 12 4	6 4 12 7	6 19 8 9	6 51 8 11	39.5						
W.	25	2 29 28 10	3 2 29 8	6 34 12 10	7 1 13 3	7 21 9 1	7 50 9 3	40.5						
Th.	26	3 32 30 7	4 1 31 6	7 24 13 7	7 47 13 11	8 15 9 6	8 40 9 9	41.5						
F.	27	4 27 32 6	4 51 33 6	8 7 14 4	8 26 14 8	9 3 9 11	9 24 10 1	42.5						
S.	28	5 14 34 5	5 36 36 3	8 44 15 0	9 2 15 4	9 44 10 4	10 2 10 6	43.5						
	29	5 58 35 11	6 20 36 5	9 21 15 7	9 41 15 10	10 19 10 8	10 38 10 10	44.5						
M.	30	6 42 36 11	7 3 37 5	10 0 16 0	10 18 16 1	10 57 11 0	11 16 11 1	45.5						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.
1	16	18		9	16	0		17	14	46		25	12	40	
2	16	19		10	15	53		18	14	33		26	12	21	
3	16	19		11	15	46		19	14	19		27	12	1	
4	16	18		12	15	39		20	14	5		28	11	41	
5	16	16		13	15	30		21	13	49		29	11	20	
6	16	13		14	15	20		22	13	33		30	10	58	
7	16	9		15	15	10		23	13	16					
8	16	5		16	14	58		24	12	59					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. ! HOLYHEAD add 18 m. ! KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

DECEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																																												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																								
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.																																							
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.																																		
Tu.	1	om45	4	13	19	4	4	34	19	4	6	9	15	8	6	30	15	6	—	—	—	—	0	10	12	9	0	10	12	9																																	
W.	2	1 43	4	55	19	3	5	16	19	1	6	49	15	9	7	9	15	4	0	33	12	9	0	55	12	8	0	55	12	8																																	
Th.	3	2 42	5	38	18	10	6	2	18	6	7	30	15	8	7	51	15	11	1	17	12	7	1	40	12	6	1	40	12	6																																	
F.	4	3 40	6	27	18	0	6	52	17	5	8	14	15	3	8	38	14	5	2	4	12	4	2	28	12	2	2	28	12	2																																	
S.	5	4 37	7	19	16	10	7	48	16	3	9	3	14	9	9	29	13	9	2	53	11	11	3	19	11	8	3	19	11	8																																	
S.	6	5 31	8	18	15	9	8	48	15	4	9	58	14	0	10	28	13	1	3	47	11	6	4	15	11	3	4	15	11	3																																	
M.	7	6 23	9	22	15	1	9	59	15	11	10	59	13	6	11	34	12	8	4	44	11	0	5	16	10	9	5	16	10	9																																	
Tu.	8	7 14	10	39	15	1	11	17	15	4	—	—	—	—	0	13	13	4	5	51	10	8	6	28	10	8	6	28	10	8																																	
W.	9	8 4	11	54	15	7	—	—	—	—	0	52	13	0	1	31	13	9	7	5	10	10	7	42	11	1	7	42	11	1																																	
Th.	10	8 53	0	26	16	0	0	55	16	6	2	7	13	7	2	38	14	3	8	16	11	4	8	46	11	7	8	46	11	7																																	
F.	11	9 44	1	22	16	11	1	47	17	4	3	7	14	3	3	34	14	8	9	14	11	10	9	41	12	0	9	41	12	0																																	
S.	12	10 35	2	11	17	9	2	34	18	2	4	0	14	8	4	25	14	11	10	6	12	2	10	30	12	3	10	30	12	3																																	
S.	13	11 26	2	56	18	5	3	17	18	7	4	49	15	1	5	12	15	2	10	52	12	4	11	13	12	4	11	13	12	4																																	
M.	14	oa18	3	37	18	7	3	57	18	6	5	32	15	3	5	53	15	2	11	33	12	5	11	54	12	4	11	54	12	4																																	
Tu.	15	1 10	4	18	18	5	4	37	18	3	6	12	15	5	6	31	15	1	—	—	—	—	0	15	12	3	0	15	12	3																																	
W.	16	2 0	4	54	18	0	5	12	17	9	6	48	15	3	7	4	14	7	0	35	12	2	0	54	12	1	0	54	12	1																																	
Th.	17	2 49	5	29	17	6	5	48	17	2	7	22	14	11	7	37	14	1	1	12	11	11	1	31	11	12	1	31	11	12																																	
F.	18	3 35	6	7	16	10	6	26	16	5	7	54	14	5	8	10	13	5	1	49	11	8	2	8	11	6	2	8	11	6																																	
S.	19	4 20	6	45	16	0	7	5	15	6	8	27	13	9	8	44	12	9	2	27	11	4	2	46	11	2	2	46	11	2																																	
S.	20	5 3	7	26	15	0	7	48	14	7	9	2	13	1	9	22	12	2	3	5	11	0	3	25	10	10	3	25	10	10																																	
M.	21	5 46	8	11	14	2	8	36	13	10	9	44	12	6	10	7	11	9	3	46	10	8	4	8	10	5	4	8	10	5																																	
Tu.	22	6 28	9	3	13	8	9	33	13	7	10	32	12	1	10	59	11	6	4	31	10	3	4	58	10	1	4	58	10	1																																	
W.	23	7 11	10	7	13	7	10	42	13	8	11	31	12	0	—	—	—	—	5	27	10	0	5	58	9	11	5	58	9	11																																	
Th.	24	7 56	11	16	13	11	11	50	14	3	0	8	11	10	0	43	12	4	6	31	9	11	7	5	10	1	7	5	10	1																																	
F.	25	8 44	—	—	—	—	0	22	14	8	1	18	12	5	1	53	12	10	7	38	10	3	8	10	10	7	8	10	10	7																																	
S.	26	9 35	0	50	15	2	1	17	15	9	2	26	13	1	2	56	13	6	8	41	10	11	9	9	11	3	9	9	11	3																																	
S.	27	10 30	1	42	16	5	2	5	17	1	3	25	13	10	3	51	14	2	9	34	11	6	9	59	11	10	9	59	11	10																																	
M.	28	11 27	2	27	17	8	2	50	18	4	4	17	14	6	4	42	14	10	10	23	12	1	10	46	12	4	10	46	12	4																																	
Tu.	29	morn.	3	13	18	10	3	35	19	3	5	6	15	3	5	29	15	3	11	9	12	6	11	31	12	9	11	31	12	9																																	
W.	30	0 27	3	58	19	6	4	22	19	8	5	53	15	9	6	17	15	7	11	54	12	10	—	—	—	—	—	—	—	—																																	
Th.	31	1 28	4	45	19	9	5	8	19	9	6	40	16	1	7	3	15	8	0	18	12	11	0	43	12	11	0	43	12	11																																	
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																																												
Phases of the Moon.																																Moon's Declination at Noon.																															
D. H. M.																																M.D. ° ' M.D. ° ' M.D. ° ' M.D. °																															
Last Quarter - 6 9 34 Afternoon.																																1 19 N.32 9 4 S. 9 17 17 S. 54 25 10 N.31																															
New - - - - - 14 1 33 Morning.																																2 19 51 10 8 34 18 15 40 26 14 6																															
First Quarter- 22 4 28 Morning.																																3 18 54 11 12 29 19 12 47 27 17 1																															
Full - - - - - 29 1 48 Afternoon.																																4 16 46 12 15 44 20 9 25 28 19 3																															
																																5 13 36 13 18 6 21 5 40 29 19 55																															
In Perigee - - 4 8 0 Morning.																																6 9 40 14 19 31 22 1 41 30 19 29																															
In Apogee - - 19 12 0 Midnight.																																7 5 13 15 19 56 23 2 N.27 31 17 44																															
In Perigee - - 31 6 0 Afternoon.																																8 0 31 16 19 22 24 6 34																															

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

DECEMBER, 1868.

WEEK DAY.		MONTH DAY.		DOVER.				SHEERNESS.				LONDON.				C's Age AT NOON.
				MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. P. L.		H. M. P. L.		H. M. P. L.		H. M. P. L.		H. M. P. L.		H. M. P. L.		H. M. P. L.	D.	
Tu.	1	11 44 18	10	—	—	1 5 16	2	1 25 16	3	2 36 19	1	2 54 19	3	17'0		
W.	2	0 6 18	11	0 30 18	10	1 45 16	3	2 5 16	3	3 15 19	4	3 36 19	4	18'0		
Th.	3	0 54 18	9	1 18 18	7	2 26 16	2	2 47 16	1	3 56 19	4	4 17 19	3	19'0		
F.	4	1 43 18	5	2 8 18	1	3 8 15	11	3 32 15	8	4 40 19	1	5 2 18	10	20'0		
S.	5	2 34 17	8	3 0 17	3	3 57 15	4	4 22 15	0	5 26 18	7	5 52 18	3	21'0		
S.	6	3 27 16	10	3 55 16	5	4 49 14	8	5 20 14	5	6 20 17	11	6 48 17	7	22'0		
M.	7	4 23 16	0	4 52 15	8	5 51 14	2	6 24 13	11	7 18 17	4	7 52 17	0	23'0		
Tu.	8	5 23 15	6	5 56 15	5	7 2 13	9	7 40 13	10	8 28 16	10	9 7 16	9	24'0		
W.	9	6 31 15	8	7 8 16	0	8 20 13	11	8 56 14	2	9 45 16	8	10 21 16	10	25'0		
Th.	10	7 41 16	5	8 11 16	10	9 31 14	5	10 2 14	8	10 58 17	0	11 31 17	3	26'0		
F.	11	8 38 17	2	9 4 17	5	10 30 14	11	10 56 15	2	11 59 17	6	—	—	27'0		
S.	12	9 29 17	8	9 54 17	11	11 20 15	4	11 43 15	7	0 25 17	8	0 50 17	11	28'0		
S.	13	10 18 18	1	10 41 18	2	—	—	0 6 15	9	1 15 18	2	1 37 18	5	29'0		
M.	14	11 4 18	3	11 26 18	2	0 29 15	10	0 50 15	10	1 59 18	7	2 20 18	8	30'0		
Tu.	15	11 48 18	1	—	—	1 10 15	11	1 30 15	10	2 41 18	9	3 1 18	9	1'4		
W.	16	0 8 18	0	0 28 17	10	1 49 15	9	2 7 15	7	3 20 18	9	3 37 18	8	2'4		
Th.	17	0 48 17	8	1 8 17	6	2 25 15	6	2 43 15	4	3 55 18	7	4 14 18	5	3'4		
F.	18	1 28 17	3	1 48 17	1	3 0 15	2	3 18 14	11	4 31 18	3	4 50 18	0	4'4		
S.	19	2 8 16	10	2 27 16	6	3 37 14	8	3 57 14	6	5 8 17	10	5 28 17	7	5'4		
S.	20	2 46 16	1	3 6 15	9	4 16 14	3	4 35 13	11	5 47 17	4	6 8 17	1	6'4		
M.	21	3 27 15	6	3 49 15	2	4 56 13	8	5 20 13	6	6 28 16	10	6 48 16	7	7'4		
Tu.	22	4 12 14	10	4 36 14	6	5 45 13	3	6 11 13	1	7 13 16	4	7 39 16	1	8'4		
W.	23	5 2 14	4	5 30 14	3	6 42 12	11	7 13 12	11	8 8 15	11	8 42 15	10	9'4		
Th.	24	6 0 14	3	6 31 14	6	7 49 13	0	8 23 13	1	9 16 15	10	9 49 15	9	10'4		
F.	25	7 3 14	10	7 36 15	3	8 56 13	4	9 28 13	7	10 21 15	11	10 54 16	1	11'4		
S.	26	8 6 15	9	8 33 16	2	9 59 13	11	10 26 14	3	11 26 16	4	11 56 16	8	12'4		
S.	27	8 58 16	8	9 22 17	2	10 52 14	6	11 16 14	10	—	—	0 21 17	0	13'4		
M.	28	9 47 17	7	10 12 18	0	11 38 15	2	12 0 15	6	0 44 17	4	1 7 17	9	14'4		
Tu.	29	10 37 18	5	11 1 18	9	—	—	0 23 15	9	1 30 18	1	1 53 18	6	15'4		
W.	30	11 26 19	0	11 52 19	2	0 46 16	0	1 8 16	3	2 15 18	10	2 38 19	1	16'4		
Th.	31	—	—	0 17 19	3	1 31 16	5	1 55 16	6	3 2 19	4	3 24 19	6	17'4		

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
1	10 35		9	7 14		17	3 24		25	0 35	
2	10 12		10	6 46		18	2 55		26	1 4	
3	9 48		11	6 18		19	2 25		27	1 34	
4	9 24		12	5 50		20	1 55		28	2 3	
5	8 59		13	5 21		21	1 25		29	2 32	
6	8 33		14	4 53		22	0 55		30	3 1	
7	8 7		15	4 23		23	0 25		31	3 30	
8	7 41		16	3 54		24	0 5	Sub.			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

DECEMBER, 1868.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
Tu.	1	0 m 45	0	17	9	9	0	38	9	10	11	50	26	3	—	—	—	—	6	40	21	3	7	0	21	5
W.	2	1 43	0	59	9	10	1	21	9	10	0	11	26	4	0	32	26	3	7	21	21	2	7	43	21	0
Th.	3	2 42	1	43	9	10	2	5	9	9	0	54	26	0	1	16	25	8	8	6	20	8	8	30	20	4
F.	4	3 40	2	28	9	8	2	52	9	6	1	38	25	2	2	2	24	7	8	54	19	11	9	18	19	3
S.	5	4 37	3	16	9	5	3	42	9	3	2	27	23	11	2	53	23	6	9	43	18	11	10	8	18	9
S.	6	5 31	4	10	9	2	4	39	9	0	3	21	22	11	3	51	22	4	10	34	17	10	11	0	17	4
M.	7	6 23	5	9	8	11	5	42	8	9	4	24	21	10	5	1	21	6	11	28	17	0	12	0	16	10
Tu.	8	7 14	6	17	8	8	6	54	8	7	5	40	21	6	6	23	21	8	—	—	—	—	0	35	16	10
W.	9	8 4	7	31	8	8	8	7	8	9	7	0	22	0	7	35	22	5	1	16	17	0	1	56	17	4
Th.	10	8 53	8	39	8	11	9	8	9	1	8	6	22	11	8	33	23	6	2	31	17	10	3	4	18	4
F.	11	9 44	9	35	9	2	10	1	9	3	8	58	24	0	9	22	24	4	3	33	18	10	4	1	19	3
S.	12	10 35	10	26	9	4	10	51	9	4	9	45	24	9	10	8	25	0	4	28	19	7	4	54	19	10
S.	13	11 26	11	15	9	5	11	38	9	5	10	30	25	2	10	52	25	3	5	19	20	2	5	43	20	5
M.	14	0 18	—	—	—	—	0	1	9	6	11	13	25	4	11	33	25	4	6	5	20	5	6	24	20	3
Tu.	15	1 10	0	21	9	6	0	41	9	6	11	54	25	2	—	—	—	—	6	44	20	4	7	2	20	2
W.	16	2 0	1	1	9	6	1	20	9	5	0	13	25	1	0	31	24	10	7	20	19	11	7	39	19	8
Th.	17	2 49	1	38	9	5	1	56	9	4	0	49	24	7	1	7	24	3	7	57	19	5	8	16	19	3
F.	18	3 35	2	14	9	3	2	33	9	2	1	25	23	9	1	44	23	3	8	35	18	9	8	54	18	4
S.	19	4 20	2	52	9	0	3	10	8	11	2	3	22	10	2	21	22	5	9	12	17	11	9	29	17	0
S.	20	5 3	3	29	8	10	3	49	8	9	2	39	21	11	2	59	21	6	9	48	17	1	10	8	16	9
M.	21	5 46	4	10	8	8	4	33	8	7	3	21	21	1	3	45	20	7	10	29	16	4	10	50	15	10
Tu.	22	6 28	4	57	8	5	5	23	8	4	4	10	20	3	4	41	19	10	11	12	15	6	11	38	15	5
W.	23	7 11	5	53	8	3	6	25	8	2	5	13	19	10	5	49	19	10	—	—	—	—	0	7	15	4
Th.	24	7 56	6	57	8	2	7	30	8	3	6	26	20	0	7	0	20	4	0	38	15	5	1	14	15	7
F.	25	8 44	8	2	8	4	8	34	8	6	7	32	20	10	8	2	21	5	1	51	15	11	2	25	16	3
S.	26	9 35	9	3	8	8	9	30	8	10	8	30	22	0	8	55	22	8	2	56	17	0	3	26	17	8
S.	27	10 30	9	55	9	0	10	19	9	2	9	18	23	4	9	40	24	0	3	53	18	3	4	20	18	10
M.	28	11 27	10	44	9	3	11	9	9	5	10	1	24	7	10	24	25	1	4	46	19	7	5	13	20	8
Tu.	29	morn.	11	34	9	6	11	58	9	8	10	47	25	7	11	10	26	0	5	38	20	7	6	2	21	0
W.	30	0 27	—	—	—	—	0	22	9	10	11	34	26	5	11	58	26	8	6	25	21	4	6	48	21	7
Th.	31	1 28	0	46	9	11	1	10	9	11	—	—	—	—	0	21	26	10	7	11	21	9	7	34	21	8
Half Mean Spring Range.			4ft. 10in.								13ft. 0in.								10ft. 6in.							

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	6	9	34	Afternoon.
New - - - - -	14	1	33	Morning.
First Quarter -	22	4	28	Morning.
Full - - - - -	29	1	48	Afternoon.
<hr/>				
In Perigee - -	4	8	0	Morning.
In Apogee - -	19	12	0	Midnight.
In Perigee - -	31	6	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	19	N.32	9	4	S. 9	17	17	S.54	25	10	N.31
2	19	51	10	8	34	18	15	40	26	14	3
3	18	54	11	12	29	19	12	47	27	17	11
4	16	46	12	15	44	20	9	25	28	19	3
5	13	36	13	18	6	21	5	40	29	19	53
6	9	40	14	19	31	22	1	41	30	19	29
7	5	13	15	19	56	23	2	N.27	31	17	44
8	0	31	16	19	22	24	6	34			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

DECEMBER, 1868.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.
Tu.	1	7	24	37	8	7	44	37	9	10	37	16	2	10	56	16	2	11	36	11	1	11	58	11	0	17°0
W.	2	8	5	37	8	8	26	37	5	11	17	16	1	11	40	15	11	—	—	—	—	0	20	10	11	18°0
Th.	3	8	47	37	1	9	8	36	7	—	—	—	—	0	4	15	9	0	43	10	10	1	7	10	8	19°0
F.	4	9	30	35	11	9	52	35	1	0	30	15	6	0	57	15	2	1	32	10	6	1	57	10	4	20°0
S.	5	10	13	34	2	10	36	33	4	1	24	14	10	1	53	14	6	2	24	10	2	2	52	9	11	21°0
S.	6	11	1	32	5	11	29	31	8	2	24	14	2	2	56	13	10	3	23	9	9	3	55	9	7	22°0
M.	7	—	—	—	—	0	2	31	0	3	31	13	8	4	10	13	6	4	29	9	5	5	6	9	4	23°0
Tu.	8	0	36	30	10	1	13	30	9	4	49	13	6	5	26	13	7	5	40	9	4	6	14	9	5	24°0
W.	9	1	51	31	1	2	29	31	7	6	1	13	10	6	34	14	0	6	48	9	7	7	21	9	9	25°0
Th.	10	3	4	32	3	3	38	32	11	7	2	14	3	7	29	14	7	7	51	9	11	8	20	10	0	26°0
F.	11	4	10	33	7	4	41	34	3	7	54	14	10	8	18	15	0	8	48	10	2	9	15	10	4	27°0
S.	12	5	9	34	11	5	35	35	5	8	40	15	3	9	2	15	5	9	40	10	5	10	2	10	7	28°0
S.	13	6	1	35	10	6	25	36	0	9	24	15	6	9	45	15	7	10	22	10	8	10	42	10	9	29°0
M.	14	6	47	36	1	7	8	36	2	10	4	15	8	10	22	15	7	11	2	10	9	11	21	10	9	30°0
Tu.	15	7	28	36	2	7	46	36	0	10	40	15	6	10	58	15	5	11	41	10	8	12	0	10	7	1°4
W.	16	8	4	35	8	8	22	35	3	11	15	15	3	11	34	15	1	—	—	—	—	0	19	10	6	2°4
Th.	17	8	39	34	11	8	56	34	5	11	54	14	10	—	—	—	—	0	38	10	4	0	57	10	2	3°4
F.	18	9	13	33	11	9	30	33	4	0	14	14	7	0	35	14	4	1	17	10	0	1	37	9	11	4°4
S.	19	9	16	32	9	10	2	32	0	0	57	14	1	1	18	13	10	1	57	9	9	2	18	9	7	5°4
S.	20	10	17	31	3	10	35	30	8	1	38	13	6	2	0	13	3	2	38	9	5	2	59	9	3	6°4
M.	21	10	55	29	11	11	16	29	3	2	24	13	0	2	50	12	9	3	23	9	2	3	48	9	0	7°4
Tu.	22	11	43	28	9	—	—	—	—	3	18	12	7	3	49	12	5	4	15	8	11	4	46	8	9	8°4
W.	23	0	13	28	6	0	44	28	4	4	22	12	5	4	57	12	6	5	17	8	9	5	48	8	9	9°4
Th.	24	1	17	28	6	1	51	28	10	5	30	12	7	6	1	12	10	6	18	8	10	6	48	9	0	10°4
F.	25	2	24	29	4	2	57	30	0	6	31	13	1	7	0	13	4	7	18	9	2	7	47	9	4	11°4
S.	26	3	30	30	10	4	2	31	9	7	26	13	8	7	51	14	0	8	15	9	7	8	42	9	9	12°4
S.	27	4	32	32	9	5	0	33	10	8	14	14	5	8	36	14	10	9	8	10	0	9	33	10	2	13°4
M.	28	5	27	34	10	5	54	35	9	8	57	15	2	9	19	15	6	9	56	10	5	10	18	10	7	14°4
Tu.	29	6	20	36	6	6	44	37	1	9	41	15	10	10	3	16	1	10	39	10	10	11	0	11	0	15°4
W.	30	7	8	37	8	7	32	38	3	10	25	16	3	10	46	16	5	11	22	11	2	11	45	11	2	16°4
Th.	31	7	55	38	5	8	18	38	6	11	7	16	5	11	30	16	5	—	—	—	—	0	9	11	2	17°4
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.
1	10	35	Add.	9	7	14	Add.	17	3	24	Add.	25	0	35	Sub.
2	10	12		10	6	46		18	2	55		26	1	4	
3	9	48		11	6	18		19	2	25		27	1	34	
4	9	24		12	5	50		20	1	55		28	2	3	
5	8	59		13	5	21		21	1	25		29	2	32	
6	8	33		14	4	53		22	0	55		30	3	1	
7	8	7		15	4	23		23	0	25		31	3	30	
8	7	41		16	3	54		24	0	5	Sub.				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

DECEMBER, 1868.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D.
Tu.	1	5 4 15 0		5 25 15 0		5 30 11 11		5 51 11 11		5 51 12 6		6 12 12 7		17°0
W.	2	5 46 14 11		6 9 14 9		6 13 11 10		6 35 11 9		6 34 12 7		6 57 12 6		18°0
Th.	3	6 32 14 6		6 57 14 3		6 58 11 7		7 21 11 5		7 19 12 5		7 41 12 4		19°0
F.	4	7 22 13 11		7 49 13 6		7 45 11 2		8 9 10 11		8 4 12 2		8 27 11 11		20°0
S.	5	8 17 13 1		8 47 12 7		8 33 10 8		9 0 10 5		8 50 11 8		9 15 11 5		21°0
A.	6	9 18 12 3		9 51 12 0		9 26 10 2		9 53 10 0		9 42 11 2		10 13 10 11		(
M.	7	10 27 11 9		11 4 11 10		10 26 9 10		11 2 9 9		10 48 10 8		11 22 10 7		23°0
Tu.	8	11 42 11 11		— —		11 40 9 9		— —		11 55 10 6		— —		24°0
W.	9	0 18 12 1		0 52 12 4		0 17 9 10		0 53 10 0		0 29 10 7		1 3 10 9		25°0
Th.	10	1 20 12 8		1 46 13 0		1 28 10 3		1 59 10 5		1 36 11 0		2 9 11 3		26°0
F.	11	2 12 13 3		2 37 13 6		2 27 10 8		2 54 10 10		2 40 11 5		3 10 11 7		27°0
S.	12	3 1 13 9		3 24 13 11		3 20 11 0		3 45 11 2		3 38 11 9		4 5 11 11		28°0
A.	13	3 47 14 1		4 8 14 3		4 9 11 4		4 31 11 5		4 31 12 0		4 54 12 1		29°0
M.	14	4 28 14 4		4 47 14 4		4 53 11 5		5 14 11 5		5 15 12 1		5 34 12 1		●
Tu.	15	5 7 14 4		5 26 14 2		5 35 11 5		5 54 11 4		5 55 12 1		6 14 12 0		1°4
W.	16	5 45 14 0		6 4 13 10		6 12 11 3		6 31 11 1		6 33 11 11		6 52 11 10		2°4
Th.	17	6 23 13 7		6 42 13 4		6 49 11 0		7 7 10 9		7 10 11 9		7 28 11 7		3°4
F.	18	7 2 13 0		7 22 12 9		7 26 10 7		7 45 10 5		7 46 11 6		8 4 11 4		4°4
S.	19	7 43 12 5		8 3 12 1		8 3 10 2		8 20 10 0		8 21 11 2		8 38 11 0		5°4
A.	20	8 24 11 8		8 47 11 4		8 38 9 9		8 59 9 7		8 55 10 9		9 14 10 7		6°4
M.	21	9 11 11 1		9 37 10 10		9 21 9 5		9 42 9 3		9 35 10 5		10 0 10 2		7°4
Tu.	22	10 7 10 8		10 39 10 8		10 17 9 1		10 37 9 0		10 30 10 0		11 0 9 10)
W.	23	11 12 10 8		11 46 10 10		11 10 9 0		11 43 9 0		11 29 9 9		12 0 9 9		9°4
Th.	24	— —		0 18 11 0		— —		0 16 9 2		— —		0 30 9 11		10°4
F.	25	0 48 11 3		1 17 11 7		0 48 9 4		1 21 9 7		1 0 10 1		1 30 10 3		11°4
S.	26	1 44 12 0		2 8 12 5		1 53 9 9		2 22 10 1		2 1 10 6		2 32 10 10		12°4
A.	27	2 32 12 10		2 55 13 3		2 48 10 4		3 13 10 8		3 2 11 2		3 29 11 5		13°4
M.	28	3 18 13 8		3 41 14 0		3 38 11 0		4 3 11 3		3 56 11 9		4 23 12 0		14°4
Tu.	29	4 4 14 5		4 26 14 9		4 27 11 6		4 50 11 9		4 49 12 3		5 13 12 5		○
W.	30	4 48 15 1		5 11 15 3		5 14 11 11		5 38 12 0		5 36 12 6		5 59 12 8		16°4
Th.	31	5 35 15 4		5 59 15 4		6 2 12 1		6 26 12 1		6 23 12 9		6 47 12 10		17°4

Half Mean Spring } 7ft. 5in. 5ft. 10in. 6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.
1	10	35		9	7	14		17	3	24		25	0	35	
2	10	12		10	6	46		18	2	55		26	1	4	
3	9	48		11	6	18		19	2	25		27	1	34	
4	9	24		12	5	50		20	1	55		28	2	3	
5	8	59		13	5	21		21	1	25		29	2	32	
6	8	33		14	4	53		22	0	55		30	3	1	
7	8	7		15	4	23		23	0	25		31	3	30	
8	7	41		16	3	54		24	0	5	Sub.				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6 0	
	Add							Subtract						
Feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	3 0	2 11	2 7	2 1	1 6	0 9	0 0	0 9	1 6	2 1	2 7	2 11	3 0	
4	4 0	3 10	3 6	2 10	2 0	1 0	0 0	1 0	2 0	2 10	3 6	3 10	4 0	
5	5 0	4 10	4 4	3 6	2 6	1 3	0 0	1 3	2 6	3 6	4 4	4 10	5 0	
6	6 0	5 10	5 2	4 3	3 0	1 7	0 0	1 7	3 0	4 3	5 2	5 10	6 0	
7	7 0	6 9	6 1	4 11	3 6	1 10	0 0	1 10	3 6	4 11	6 1	6 9	7 0	
8	8 0	7 9	6 11	5 8	4 0	2 1	0 0	2 1	4 0	5 8	6 11	7 9	8 0	
9	9 0	8 8	7 9	6 4	4 6	2 4	0 0	2 4	4 6	6 4	7 9	8 8	9 0	
10	10 0	9 8	8 8	7 1	5 0	2 7	0 0	2 7	5 0	7 1	8 8	9 8	10 0	
11	11 0	10 8	9 6	7 9	5 6	2 10	0 0	2 10	5 6	7 9	9 6	10 8	11 0	
12	12 0	11 7	10 5	8 6	6 0	3 1	0 0	3 1	6 0	8 6	10 5	11 7	12 0	
13	13 0	12 7	11 3	9 2	6 6	3 4	0 0	3 4	6 6	9 2	11 3	12 7	13 0	
14	14 0	13 6	12 1	9 11	7 0	3 7	0 0	3 7	7 0	9 11	12 1	13 6	14 0	
15	15 0	14 6	13 0	10 7	7 6	3 11	0 0	3 11	7 6	10 7	13 0	14 6	15 0	
16	16 0	15 5	13 10	11 4	8 0	4 2	0 0	4 2	8 0	11 4	13 10	15 5	16 0	
17	17 0	16 5	14 9	12 0	8 6	4 5	0 0	4 5	8 6	12 0	14 9	16 5	17 0	
18	18 0	17 5	15 7	12 9	9 0	4 8	0 0	4 8	9 0	12 9	15 7	17 5	18 0	
19	19 0	18 4	16 5	13 5	9 6	4 11	0 0	4 11	9 6	13 5	16 5	18 4	19 0	
20	20 0	19 4	17 4	14 2	10 0	5 2	0 0	5 2	10 0	14 2	17 4	19 4	20 0	
21	21 0	20 3	18 2	14 10	10 6	5 5	0 0	5 5	10 6	14 10	18 2	20 3	21 0	
22	22 0	21 3	19 1	15 7	11 0	5 8	0 0	5 8	11 0	15 7	19 1	21 3	22 0	
23	23 0	22 3	19 11	16 3	11 6	5 11	0 0	5 11	11 6	16 3	19 11	22 3	23 0	
24	24 0	23 2	20 9	17 0	12 0	6 2	0 0	6 2	12 0	17 0	20 9	23 2	24 0	

RULE—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to,

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions ; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 4th, A.M., at 2 h. after high water.

					Ft.	in.
Height of high water (by the tables)	-	-	-	-	20	6
Half mean spring range	-	-	-	-	13	0
						<hr/>
Height above the half-tide or mean level of the sea	-	=			7	6
Half mean spring range	-	-	-	-	13	0
By table (B) 7 ft. 6 in. gives	-	-	-	-	+	3 9
						<hr/>
Height of the tide above zero at 2 h. after high water	=				16	9

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 9th, P.M., at 4 h. after high water.

					Ft.	in.
Height of high water (by the tables)	-	-	-	-	28	0
Half mean spring range	-	-	-	-	13	0
						<hr/>
Height above the half-tide or mean level of the sea	-				15	0
Half mean spring range	-	-	-	-	13	0
By table (B) 15 ft. 0 in. gives	-	-	-	-	-	7 6
						<hr/>
Height of the tide above zero at 4 h. after high water	=				5	6

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 9th, P.M. at 5½ h. after high water.

					Ft.	in.
Height of high water (by the tables)	-	-	-	-	28	0
Half mean spring range	-	-	-	-	13	0
						<hr/>
Height above the half tide or mean level of the sea	-				15	0
Half mean spring range	-	-	-	-	13	0
By table (B) 15 ft. 0 in. at 5½ h. from high water	-				14	6
						<hr/>
Level of the tide <i>below</i> zero	-	-	-	-	1	6

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced: for example—The soundings on the chart of Liverpool are reduced to a zero 15 ft. below the mean level of the sea, whereas, the mean spring range for that place, as shown in the result of two years' observations

(1854 and 1855) of the Self-registering Tide Gauge at St. George's Pier, being 26 ft. gives 13 ft. below the mean level of the sea;* consequently 2 ft. will have to be added to the results deduced from table (B.)

Thus, in Example I. On the chart of Liverpool 11 ft. being marked on the bar of the Victoria Channel, the actual depth over the bar at 2h. after high water would be 16 ft. 9 in. + 11 ft. 0 in. + 2 ft. 0 in. = 29 ft. 9 in.

CORRECTIONS FOR CERTAIN DOCKS, &c.†

The depth at high water on the sills of the following Docks may be known, by applying to the standard high water heights given in the foregoing Tables the annexed correction according to the sign.

				Ft.	in.
<i>Falmouth</i>	Over the Sill of Graving Dock No. 1.	-	-	2	0
	Graving Dock No. 2.	-	-	0	0
	(applied to the heights given for Holyhead.)				
<i>Devonport</i>	Over the Sill of Basin	-	-	+15	3
<i>H. M. Dockyard.</i>	South Dock	-	-	+12	5
	New Long Dock	-	-	+16	8
	Old North Dock	-	-	+4	11
	New North Dock	-	-	+5	2
„ <i>Keyham</i>	Entrance to Lock	-	-	+18	2
	Entrance to North Basin	-	-	+16	2
	No. 1 Dock	-	-	+8	2
	2 „	-	-	+5	2
	3 „	-	-	+9	2
<i>Plymouth</i>	Great Western Docks, Millbay.				
	Over the Sill of Floating Dock	-	-	+10	3
	Graving Dock	-	-	+11	9
	(applied to the heights given for Devonport.)				
<i>Portsmouth</i>	Over the Sill of No. 1 or South Dock	-	-	+6	8
<i>H. M. Dockyard.</i>	Entrance	}	Basin Dock	+13	4
	No. 2			+10	4
	3			+12	5
	4			+13	0
	5			+6	10
	No. 6 or North Dock	-	-	+6	4
	Entrance	}	Steam Basin	+12	2
	No. 7			+14	2
	8			+9	1
	9 at N. end of Slips	-	-	+8	1
	10 South „	-	-	+14	2
	11 Steam Basin	-	-	+14	2
<i>Portsmouth</i>	Over the Sill of the New Commercial Graving Dock	-	-	+4	10
<i>Sheerness</i>	Over the Invert at the				
<i>H. M. Dockyard.</i>	entrance	}	Great Basin -	+9	8
	Sill of No. 1 Dock			+9	2
	2 „			+9	2
	3 „			+9	2
	No. 4 Dock	}	Boat Basin -	+3	10
	5 „			-1	4

* The datum mark at Liverpool is the level of the Old Dock Sill. From the two years' observations above alluded to, this datum mark is 5 ft. below the half tide or mean level of the sea, and consequently 8 ft. above the zero of these Tables.
† As it is desirable that the information here given should be accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

						Ft.	in.
<i>Chatham</i> —Over the Sill of No. 1 Dock	-	-	-	-	-	3	11
<i>H. M. Dockyard</i>	"	2	"	-	-	+	3 5
	"	3	"	-	-	+	3 4
	"	4	"	-	-	+	0 5
(applied to the Heights given for London.)							
<i>Woolwich</i> —Over the Sill at the entrance of Outer Basin	-	-	-	-	-	+	3 7
<i>H. M. Dockyard.</i>	"					+	1 10
	"					+	2 10
	"					+	1 10
	"					+	1 10
(applied to the heights given for London.)							
<i>Deptford</i> —Over the Sill of Outer Dock	-	-	-	-	-	4	2
<i>H. M. Dockyard.</i>	"					6	2
(applied to the Heights given for London.)							
<i>London</i> —Over the Sill of St. Katherine Dock	-	-	-	-	-	+	8 9
"						+	0 10
"	"					+	3 9
"	"					+	6 2
"	"					+	8 10
"						+	7 10
"						-	0 2
"						}	- 1 3
"						-	0 8
"						+	8 3
"						}	+ 3 10
"						}	+ 4 4
"						}	- 0 8
"						+	7 10
"						}	+ 4 7
"						+	6 3
"						+	3 11
"						+	5 4
"						+	8 10
<i>Hull</i> —Over the Sill of Humber Dock	-	-	-	-	-	+	4 3
<i>Middlesbrough</i> —Over the Sill of the Dock	-	-	-	-	-	+	4 1
(applied to the Heights given for Sunderland.)							
<i>Hartlepool</i> —Over the Sills of Victoria, West or Coal Dock,	}					+	6 8
Swainston and Jackson Docks							
(applied to the Heights given for Sunderland.)							
<i>Sunderland</i> —Over the Sill of Wearmouth Dock	-	-	-	-	-	+	6 0
"						+	6 0
"	"					}	+ 8 0
"	"					+	10 0
"						+	12 0
"						+	2 0
"						+	2 0
<i>Newcastle-upon-Tyne</i> —Over the Sills of Northumberland	}					+	9 4
Dock and Basin							
"						+	10 1
(applied to the Heights given for North Shields.)							
<i>Leith</i> —Over the Sills of East and West Docks	-	-	-	-	-	+	0 7
						+	6 7
"						+	5 0

* Expected to be opened in 1868.

				Ft.	in.
<i>Cardiff</i> —Over the Sill of East Dock	-	-	-	6	2
<i>Bute Docks.</i> " West Dock	-	-	-	9	2
(applied to the Heights given for Weston-super-mare.)					
<i>Pembroke</i> —Over the Sill of Dock Entrance	-	-	+	3	6
<i>H. M. Dockyard.</i>					
<i>Liverpool</i> —					
Over the Sill of North Carriers Dock, West Passage	—			2	0
" South " West Passage	—			2	0
" Canada Half-tide Dock, W. Entrance	—			0	3
" Northern West Lock Entrance	-			2	0
" Southern West Lock Entrance	-			2	0
" " North Passage	—			5	0
" " South Passage	—			0	3
" Canada Dock, South Passages, East	—			1	6
" " " West	—			1	6
" " Lock	-			0	3
" Huskisson Dock, East Lock	-			1	6
" " West "	-			2	0
" Sandon Dock, West Entrance	-			1	6
" Wellington Half-tide Dock, East Entrance	—			1	3
" " " West "	-			1	6
" Wellington Dock, West Passage	-			1	6
" Bramley-Moore Dock, North Passage	-			2	0
" " South Passage	-			2	0
" Nelson Dock, South Passage	-			1	6
" Stanley Dock, West Passage	-			2	4
" Collingwood Dock, West Passage	-			1	3
" Salisbury Dock, West Entrances, North	—			1	1
" " " South	—			1	1
" Clarence Graving Dock Basin, N. Passage	—			3	3
" " " S. Passage	—			3	6
" Clarence Half-tide Dock, West Entrance	—			3	0
" " Dock, West Passage	-			4	10
" Trafalgar Lock, North and South Passages	—			1	5
" " Dock, South Passage	-			3	1
" Victoria Dock, South Passage	-			3	1
" Waterloo Dock and Lock, North Passage	—			0	9
" " " South Entrance	—			0	9
" Princes Dock and Locks, North Entrance	—			0	9
" " " South Entrance	—			0	9
" Georges Dock and Passage, North Entrance	—			3	6
" " " South Passage	—			3	6
" Manchester Dock, West Entrance	-			8	3
" " Lock, West Entrance	-			4	3
" Canning Dock, West Passage	-			1	11
" " Half-tide Basin, two West En- trances, each	—			1	9
" Albert Dock, North Passage	-			1	8
" " East Passage	-			2	0
" Salthouse Dock, North Passage	-			2	0
" Wapping Basin, West Passage	-			2	0
" " North and South Passages, each	—			2	0
" " Dock, West Passage	-			2	0
" " South Passage	-			2	0
" Kings Dock, South Passage	-			3	0
" Queens Dock Basin, West Entrances, North	—			1	3
" " " South	—			1	3
" " West Passage	-			2	0
" " South Passage	-			1	6
" Coburg Dock, West Entrance	-			2	0

Liverpool—continued :

	Ft.	in.
Over the Sill of Brunswick Dock, North Passage -	—	1 6
„ „ Half-tide Dock, East Passage -	—	2 6
„ „ „ „ West Entrance -	—	2 0
„ Toxteth Dock, West Entrance -	—	3 0
„ Harrington Dock, West Entrance -	—	6 10
„ Herculaneum, North Passage -	—	0 6
„ „ South Passage -	—	0 6
„ Garston Dock -	—	4 0
„ River Craft Dock, Lock, and Eagle Basin, } Outer Gates	—	8 3
„ „ „ „ Inner „ -	—	9 3
„ Duke of Bridgewater's Dock, Outer Gates -	—	3 6
„ „ „ „ Middle „ -	—	8 6
„ „ „ „ Inner „ -	—	2 0
„ Canada Lock and Graving Dock -	—	0 3
„ Huskisson Lock and Graving Dock -	—	1 6
„ Sandon Graving Docks, Nos. 1 to 5, East -	—	4 6
„ „ „ „ No. 6, West -	—	4 6
„ Canning Graving Docks, No. 1 -	—	9 9
„ „ „ „ No. 2 -	—	8 0
„ Queens Graving Docks, No. 1 -	—	6 4
„ „ „ „ No. 2 -	—	4 6
„ Brunswick Graving Docks, No. 1 -	—	5 6
„ „ „ „ No. 2 -	—	5 6

Birkenhead—

Over the Sill of Morpeth Dock from Morpeth Basin -	—	2 9
„ Sills of Caisson between Egerton Dock and Great } Float -	—	1 0
„ „ „ „ East and West Floats -	—	0 6
„ Lock from Low-water Basin into Great Float :		
Outer Sill	+	4 0
Inner Sill	+	1 0
„ Alfred Dock, River Entrance - 100 ft. Lock	+	4 0
50 ft. do.	+	4 0
30 ft. do.	+	4 0
„ Passage from Alfred Dock to 100 ft. Lock	+	1 0
East Float - 50 ft. do.	+	1 0
30 ft. do.	+	1 0
„ Graving Dock No. 1. -	—	0 3
„ „ „ „ 2. -	—	0 3
(applied to the heights given for Liverpool.)		

Dublin—

Over the Sill of North Wall Graving Dock .	+	6 3
„ Old Custom House Dock -	+	3 5
„ Georges Dock -	+	5 5
„ Camden Lock of Grand Canal Dock -	+	7 0
(applied to the heights given for Kingstown.)		

Londonderry—

Over the Sill of Graving Dock -	+	6 9
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TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or — to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

COAST OF IRELAND	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundstone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
„ Strangford Quay	+ 1 21	..	"
„ Carlingford (Bar) or Cranfield Point	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
St. Ives	— 2 10	..	Weston-super-mare.
Padstow	— 1 41	..	"
Lundy Island	— 1 39	..	"
Barnstaple Bar	— 1 24	..	"
Ilfracombe	— 1 12	..	"
Bridgewater Bar	— 0 4	..	"
Portishead	+ 0 22	..	"
Bristol (King Road)	+ 0 2	..	"
Cardiff	+ 0 5	..	"
Swansea (Mumbles Lighthouse)	— 0 11	..	Pembroke.
Llanelly	+ 0 4	..	"
Tenby	— 0 12	..	"
Milford Haven (entrance)	— 0 20	..	"
Fishguard, Goodic Pier	— 3 15	— 4 5	Holyhead.
Cardigan	— 3 10	..	"
Aberystwyth	— 2 40	— 3 0	"
Aberdovey	— 2 11	..	"
Barmouth	— 2 31	..	"
Pwllheli	— 2 25	..	"
Bardsey Island	— 2 31	..	"
Porth-dyn-lleyn	— 1 41	..	"
Caernarvon	— 0 38	— 2 3	"
Beaumaris	— 0 51	— 4 7	Liverpool.
Port Fleetwood (Wyre Lighthouse)	— 0 12	..	"
Poultou-le-Sands	+ 0 3	+ 1 3	"
Whitehaven	— 0 9	— 2 9	"
St. Bees Head and Port Har- rington }	— 0 18	..	"
Workington	— 0 19	..	"
Maryport	— 0 20	..	"
Abbey Head	— 0 13	..	"
Southernness	— 0 3	..	"
Annan Foot	+ 0 33	..	"
Port Carlisle	+ 0 47	..	"
Douglas, Isle of Man	+ 1 1	..	Holyhead.
Ramsey "	+ 1 1	+ 3 3	"
Peel "	+ 0 57	+ 0 3	"
Tarn Point, Solway Firth	— 0 1	— 2 11	Liverpool.
Port Patrick	— 0 58	..	Greenock.
Loch Ryan	— 0 56	..	"
Lamlash	— 0 19	..	"
Campbellton	— 0 23	..	"
Ayr	— 0 18	— 1 0	"
Ardrossan	— 0 23	..	"
Largs	— 0 18	..	"
Inverary	— 0 2	..	"
Port Glasgow	+ 0 10	..	"
Glasgow	+ 1 17	..	"
Crinan	+ 4 41	..	"
Tobermory, Isle of Mull	— 2 52	..	Thurso.
Portree, Isle of Skye	— 1 56	..	"
Loch Inver	— 1 47	..	"
Kyle Akin	— 2 12	..	"
Tanera, Summer Isles	— 1 51	..	"
Stornoway, Isle of Lewis	— 1 42	..	"
Cape Wrath	— 0 58	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Stromness	+ 0 32	..	Thurso.
Lerwick	+ 2 2	..	"
Wick	- 2 55	..	Leith.
Dornock Road	- 2 17	..	"
Cromarty	- 2 21	..	"
Inverness	- 1 59	..	"
Banff	- 1 49	..	"
Peterhead	- 1 43	..	"
Aberdeen	- 1 17	..	"
Stonehaven	- 1 7	..	"
Montrose	- 0 52	..	"
Arbroath	- 0 42	..	"
Tay Bar	- 0 11	..	"
Broughty Ferry	+ 0 5	..	"
Dundee	- 0 50	+ 0 2	Sunderland.
Dunbar	- 1 14	0 0	"
Berwick	- 1 4	..	"
Holy Island	- 0 52	..	"
Blyth	- 0 7	..	"
Tynemouth Bar	- 0 2	..	"
Seaham	+ 0 2	..	"
Hartlepool	+ 0 6	+ 0 8	"
Whitby	+ 0 23	..	"
Scarborough	+ 0 49	+ 1 5	"
Filey Bay	+ 0 58	..	"
Flamborough Head	- 1 59	..	Hull.
Bridlington	- 1 50	..	"
Spurn Point	- 1 3	..	"
Great Grimsby	- 0 53	- 1 8	"
Lynn and Boston Deep	- 0 29	..	"
Wells Bar	- 0 9	..	"
" Harbour	+ 0 31	..	"
Blakeney Bar	+ 0 1	..	"
Yarmouth Road	- 2 51	..	Harwich.
Lowestoft	- 2 9	..	"
Orfordness	- 0 51	..	"
Nore	- 0 7	..	Sheerness.
Chatham	+ 0 25	..	"
Gravesend	- 0 57	..	London.
Woolwich	- 0 28	..	"
Greenwich	- 0 24	..	"
London Docks	- 0 10	+ 0 4	"
Margate	- 2 27	..	"
Ramsgate	- 2 23	- 4 1	"
Deal	+ 0 3	..	Dover.
Folkstone	- 0 5	..	"
Dungeness	- 0 27	..	"
Rye Bay	+ 0 8	..	"
Hastings	- 0 19	..	"
Beachy Head	+ 0 8	..	"
Newhaven	+ 0 39	..	"
Shoreham	+ 0 22	- 1 2	"
Littlehampton	- 0 5	..	Portsmouth.
Selsea Bill	+ 0 4	..	"
Bembridge Point	- 0 41	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Southampton	— 1 11	..	Portsmouth.
West Cowes	— 0 56	..	„
Hurst Camber	— 1 41	..	„
Needles Point	— 1 55	..	„
Christchurch	— 2 41	..	„
Poole	— 2 31	..	„
Portland Breakwater	— 4 40	— 5 10	„
Bridport	+ 0 22	..	Devonport.
Lyme Regis	+ 0 38	..	„
Exmouth	+ 0 38	..	„
Torbay	+ 0 17	..	„
Dartmouth	+ 0 33	..	„
Plymouth Breakwater	— 0 6	..	„
East Looe	— 0 17	..	„
Fowey	— 0 29	..	„
Falmouth	— 0 46	..	„
Penzance	— 1 13	..	„
Scilly Isles (St. Mary)	— 1 16	..	„

WESTERN COAST OF EUROPE.

Gibraltar	— 1 27	..	Brest.
Cadiz	— 2 2	..	„
Lisbon (Bar)	— 1 17	..	„
Oporto	— 1 17	..	„
Ferrol	— 0 47	..	„
Santander	— 0 17	..	„
Bayonne	— 0 2	..	„
Arcachon	+ 0 50	..	„
Tour de Cordouan	— 0 10	..	„
Bordeaux	+ 3 3	..	„
Ile d'Aix	— 0 27	..	„
Ile d'Yeu	— 0 41	..	„
Ile de Noirmoutier	— 0 45	..	„
Port Navalo	— 0 5	..	„
St. Nazaire	— 0 7	..	„
Belle Ile	— 0 29	..	„
Port Louis	— 0 36	..	„
Port Concarneau	— 0 35	..	„
Ile de Sein	— 0 26	— 1 9	„
Ouessant (Ushant)	— 0 15	— 0 1	„

NORTHERN COAST OF EUROPE.

Abervrach	+ 0 27	..	Brest.
Morlaix	+ 1 6	..	„
Plougrescan	+ 1 30	..	„
Bréhat	+ 2 4	..	„
St. Malo	+ 2 18	..	„
Granville	+ 2 26	..	„
Ile de Chausey	+ 2 22	..	„
Jersey (St. Helier)	+ 2 38	..	„
Guernsey (St. Peter Port)	+ 2 50	..	„
Erehous	+ 2 45	..	„

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	. . .	Brest.
Cherbourg	+ 4 2	. . .	"
Barfleur	+ 5 4	. . .	"
La Hougue	+ 4 55	. . .	"
Honfleur	+ 5 42	+ 4 3	"
Quillebœuf	+ 6 19	— 9 7	"
Havre	+ 6 4	. . .	"
Fécamp	+ 6 57	+ 4 2	"
Dieppe	+ 7 19	. . .	"
Cayeux	+ 7 18	. . .	"
Boulogne	+ 0 13	. . .	Dover.
Cape Grisnez	+ 0 15	+ 2 4	"
Calais	+ 0 37	+ 0 10	"
Dunkerque	+ 0 56	. . .	"
Nieuport	+ 1 6	. . .	"
Ostend.	+ 1 13	. . .	"
Flushing	+ 2 8	. . .	"
Antwerp	+ 5 13	. . .	"
Hellevoetsluis	+ 3 18	. . .	"
Rotterdam	+ 4 33	. . .	"
Helgoland	— 0 33	— 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N.W. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North, till at the last 4½ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At 3¼ hours ebb on the shore it sets W.S.W.; at 4 hours W. by N.; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E.; and then E.N.E and E, by N. till about high water, when its direction is E. by S.

From Bolt Tail to Start Point, at 4 miles off shore, the eastern stream makes at 3 hours after high water, and the western stream 3 hours after low water on the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is irregular, varying from 4 to 7 hours after high and low water on the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off the Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about $4\frac{3}{4}$ hours. The direction of the western stream—for the first 2 hours is W.S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is E.N.E.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 10h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, or until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

In West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{3}{4}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{3}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour, N.N.E. to E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of the flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S.S.E., 2 knots.

At $2\frac{1}{2}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{2}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E. by N. $\frac{1}{4}$ N., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{3}{4}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W. by S. $\frac{1}{2}$ S., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W. by S. $\frac{1}{4}$ S., $1\frac{3}{4}$ knots. N.B.—About a mile south of the Bill, at half flood, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots. 2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. The 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, about west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 4h. 45m.: the flood and ebb are of equal duration, the former setting S.E., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern or flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{1}{2}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{1}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{1}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W. by S. $\frac{1}{2}$ S. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part, W. $\frac{1}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{4}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high waters occur on either shore of the Solent, as shown in the times of high water at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour, with a rise and fall of 3 or 4 inches for another hour, and only rises and falls 13 inches for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the docks on the same tide.

somewhere near the Light Vessel; for instance, at the 1st hour's flood by the shore it sets East; 2d and 3d hours, E.N.E.; 4th, N.E.; 5th, N.E. by N.; 6th, North; 7th, N.N.W. to N.W.; and the last drain of the flood, N.W. by W. The 1st hour's ebb sets W. by N.; 2d W. by S. to W.S.W.; 3d, S.W. by W. to S.W.; 4th, S.W. $\frac{1}{2}$ S., the first part of the 5th hour, S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2 o'clock, and runs $7\frac{1}{2}$ hours about S.S.E.; and the western stream at 9h. 30m., and runs nearly $4\frac{1}{2}$ hours N.N.W.

Near the Horse Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2 o'clock, $2\frac{1}{2}$ hours after the tide on the shore, and runs to the S.E. $7\frac{1}{2}$ hours; the western stream makes at 9h. 15m., $4\frac{1}{2}$ hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2 o'clock, runs to the S.E. for 2 hours, and then sets east for the remainder of the tide, $5\frac{1}{2}$ hours; the western stream makes at 9h. 45m., and runs W.N.W. $4\frac{1}{2}$ hours.

At Spithead, at full and change, the eastern stream makes about 2 o'clock, $2\frac{1}{2}$ hours after high water in the harbour, and runs 7 hours S.E. by S.; and the western stream about 9 o'clock, $2\frac{1}{2}$ hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about seven hours, and a narrow stream runs in, fifteen or twenty minutes after high water at the Dock-Yard. From the result of three years' observations taken at the Dock-Yard it appears that at high water, slack water at springs continues for eight minutes, and at neaps sixteen minutes.

Looe Stream. At the western entrance near the Pullar Buoy, at full and change, the eastern stream makes at 3h. 45m., and the western stream at 10 hours, and sets S.E. and N.W. Between 2 and 3 miles outside of the Boulder Bank, the stream turns about an hour later; the eastern stream setting E.S.E. and the western stream west. Between the Pullar Bank and the Middle Owers, the eastern stream sets E.S.E. and the western stream west. At the eastern entrance, near Eastborough Head, the eastern stream makes at 4h. 30m., and sets E. by N. $\frac{1}{2}$ N., and the western stream at 9h. 50m. west. Off the west end of the Hooe Bank, the eastern stream makes at 4h. 35m. and sets E.S.E., and the western stream at 10h. 30m. W. $\frac{3}{4}$ N.

About 1 mile S.S.E. of the South Foreland Lighthouse, the stream begins to set to the eastward about 1h. 30m. before high water on the shore at Dover, and runs from N.E. by E. to E.N.E. about $5\frac{1}{2}$ hours, or till 4 hours after high water: it then turns and sets W. by S. $\frac{3}{4}$ S. about 7 hours. At Dover the flowing stream very seldom continues more than 5 hours, and sometimes scarcely so much; it is nearly the same at Ramsgate. To the northward of the South Foreland the streams change their direction to N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S.

In the Downs the north-eastern stream begins about 1h. 20m. before high water at Dover, and continues to run 5h. 30m.: it then turns and runs in a contrary direction till 2 hours before the ensuing high water.*

In the Gull Stream, 1 mile N.N.W. from the Bunthead, the northern stream begins about 1h. 10m. before high water at Dover, and continues for 6 hours: it then turns and runs in a contrary direction till $1\frac{1}{2}$ hours before the ensuing high water. Its direction is N.E. $\frac{3}{4}$ N.; but the last hour changes to E.N.E., and even to the southward of East; the last hour of the southern stream changes from S.W. $\frac{3}{4}$ S. to W.S.W., and even to the northward of West.

* For the tides at the Southsand Head and Northsand Head of the Goodwin, see Compartment VI.

TIDES ON THE EAST COAST OF SCOTLAND AND ENGLAND.

In the North Sea the flood tide-wave enters from the Atlantic Ocean between the coast of Norway and the British Isles, and passes through the various channels formed by the Shetlands, the Orkneys, and the north point of Scotland. The average rate of the stream in the offing is very moderate, not exceeding a knot and a half; but that part of the stream which enters by the Pentland Firth acquires a furious rapidity, amounting at spring tides even to eight knots. Immediately on quitting the Firth, however, it abates in strength, as it diverges into open water; its eastern branch filling up the basin of the North Sea as it advances towards the coast of Jutland and Holland; whilst its western branch, more or less confined by the Dogger and other outlying banks, swells along the shores of Scotland and England, and makes high water in all their rivers and harbours successively till it arrives in the Thames.

The following remarks will assist the seaman in tracing the movement of the tide stream along the coast :—

Off Clythness and Ord Head its rate is about 3 knots at the springs and $1\frac{1}{2}$ with the neaps, and continues to run to the southward till 11 o'clock, or till 3h. 40m. before high water at Leith. Off Covesea Point, Burgh Head, and thence westward towards Fort George and Cromarty, it runs about an hour longer.

Off Cullen the flood stream sets slowly to the eastward, increasing in velocity as it advances: off Troop Head it runs till 1 o'clock, or till 1h. 20m. before high water at Leith; off Kinnaird Head it attains the rate of 2 knots on springs, and is still accelerated as it passes Rattray Brigs till off Peterhead, which is occasioned by the junction of the direct stream from Duncansby Head. Six miles off Kinnaird Head the stream runs to the southward till 2, and at 12 miles till 3 o'clock, or till 40 minutes after high water at Leith.

Off Buchanness the stream attains its greatest strength, namely 4 knots on the springs, and $2\frac{1}{2}$ on the neaps; but off Newburgh it decreases to less than 2 knots, and ceases at 2 o'clock; and at 4 or 5 leagues in the offing it runs till 3 o'clock, or 40 minutes after high water at Leith.

The stream runs past Girdleness till 2h. 30m., or 10m. after high water at Leith; springs at the rate of $2\frac{1}{2}$, neaps $1\frac{1}{2}$ knots. It runs across the mouth of Montrose Harbour and past Red Head till 3 o'clock, or 40 minutes after high water at Leith. From Red Head it sets into St. Andrews Bay till the last quarter, which sets S. and S.S.E.; but to the westward of Red Head it sets W.S.W. past Arbroath and over the Tay Bar.

At 2 miles without the Bell Rock Lighthouse the flood continues running to the southward till 2h. 55m. after high water at Leith; but between the Bell Rock and Fifeness it changes 2 hours earlier. The first part of the latter stream sets towards May Island, the middle to the South, and the last part S.S.E. The first part of the ebb sets from E.N.E. to N.E., the middle N.N.E., and the last part more northerly.

About a mile off St. Abbs Head the flood stream runs to the south-eastward till 2h. 55m. after high water at Leith; but at $5\frac{1}{2}$ or 6 leagues in the offing it continues a quarter of an hour later. About 3 miles off Berwick it runs till 4h. 10m. after high water at Leith.

At 5 miles off North Sunderland Point, and at the same distance south-eastward of the Staples, the flood stream continues till 3h. 25m. after high water at Leith.

About 2 miles off Blyth Harbour, and 4 miles off Tynemouth, it runs to the southward till 3h. 40m. after high water at Leith; and at 4 miles off Sunderland, a quarter of an hour later.

At 3 or 4 miles off Hartlepool, and at the same distance off Whitby, the flood stream runs to the southward till 4h. 10m. after high water at Leith; and at the same distance off Flamborough Head it continues to run half an hour longer.

Near the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 9 o'clock, or three hours after high water on the shore.

Four miles off Cromer, and the same distance off Hasborough, the flood stream runs along shore to the southward till 10h. 15m., or 1h. 45m. before high water at Harwich, and the ebb in a contrary direction.

At 2½ miles off Lowestoft the flood stream continues to run to the S.S.W. till 1h. 30m. before high water at Harwich.

At Orfordness the flood stream continues to run till about high water in Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

At Margate it is high water about 11h. 40m. by the ground. Near the East buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 9h. 15m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, and increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished velocity, till at low water it falls slack at south.

In the River Medway the flood stream runs up in mid-channel from twenty to twenty-five minutes after high water at Sheerness Dock-Yard; but at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the Thames for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the times and the heights of high water. Thus in the North Sea a strong N.N.W. gale and a low barometer raise the surface 2 or 3 feet higher, and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times and heights predicted in the Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Portland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, to the southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed further south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY CAPTAIN F. W. L. THOMAS, R.N.

THE great rapidity of the tidal streams among the Orkneys makes a correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

In the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick smoke; upon the open coast the sea rises at once, and striking upon the rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsá.

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these ripplings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

*Depth of the
Tidal Stream.*

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time: the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentlands Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick give 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

*Difference of
Sea-level.*

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appears that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

*Mean range at
North Isles.*

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

*Semidiurnal
inequality.*

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

South Isles.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

*Set of tide,
Mull of Papa.*

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fall while the flood is running, there would be a great probability of drifting ashore.

*from Mull of
Papa to North
Ronaldsha.*

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

stream off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa and North Ronaldsha 3 knots; but near North Ronaldsha the rate again increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one with a small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry,
Röst.*

*North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the flood having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2.8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long oval, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed upon a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood tide; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrake sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Trevan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely bad *röst* off the Start with southerly winds and flood tide; it stretching 3 or 4 miles to sea, but being heaviest near the shore.

Start of Sanda.

Röst.

Between Westra and Sanda the stream is scarcely sensible, but gathering strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Stronsa Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before is low water on the shore, or $1\frac{3}{4}$ hours before it is low water in the stream, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

**Röst* (pronounced *reust*) a Scandinavian word, meaning a roaring, broken, tidal sea.

the narrows when passing Spur Ness, but it speedily becomes diffused in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.

*Stronsa and
Westra Firths.*

In the Stronsa and Westra Firths, which form one continuous and nearly straight channel, the tide stream is very rapid, as through them and Enhallow Sound the body of the ocean tide is discharged.

North Shoal.

At the North Shoal, which is 15 miles from the entrance of the Firth, the tide sets W. by S. (towards the entrance), and at springs scarcely runs 2 miles an hour; neaps about one.

*Brough of
Birsa.*

Along the coast of West Mainland, or Pomona, the stream is only sensible off the points; but off the Brough of Birsa the flood stream sets to the northward for two hours after it is high water on the shore. when its greatest rate is 2 knots.

*West coast of
Rowsa.*

From the Brough of Birsa the flood sets along shore for Costa and Sacquoy Heads, increasing in velocity as it approaches the Westra Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of Quendale.

Skea Skerries.

The flood stream runs South along the West coast of Westra, from the Noup to the point of Skea, and over the Skea Skerries. Between them and Rowsa the stream acquires great force, even 6 knots, and does not turn for two hours after high water on the shore. Its chief weight passes close round Kili Holm, and crosses for War Ness, (the South Point of Eda,) and the Greenholms.

*Kili Holm.
War Ness.*

Stronsa Firth.

At War Ness the tide stream runs 7 knots, and the röst is quite impassable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in violent commotion, and when bound to Stronsa, a line of breakers may sometimes be seen roaring and foaming within half a cable's length, while vainly looking for a gap or smooth.

The main stream from War Ness, joined by the Stream from Eda Sound, sets past Rousholm Head, and clear of Auskerry to the open sea; and from the Greenholms, past Shapinsha and Deerness, where it is joined by the String, the usual name for the direct run of the stream from Eynhallow Sound by Gairsa, Eiler Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Deerness and Auskerry about 4 knots.

*Weatherness
and Fara Ness
Sounds.*

The tides in Weatherness and Fara Ness Sounds are peculiar; the stream turns to the eastward as soon as the tide has ceased to fall upon the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it does in Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets very weakly towards Calf Sound.

*Egilsha and
Shapinsha.*

A very weak stream runs south through Howan Sound during the flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.

Sound.

The flood stream from Costa Head and the reef of Quendale runs towards Eynhallow, and divides there, passing Burgher and the Wael Race at the rate of 7 knots; the streams unite when past the island, but do not average more than 4 knots down Eynhallow Sound.

*Wyre Sound.
Swine Holm.*

A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the latter stream unites with that from the Westra Firth, the rate scarcely equals 2 knots. In the narrow channels among the group of Holms between Gairsa and Shapinsha, the flood sets southerly 6 knots.

*Between Gairsa
and Shapinsha*

*and by Work
Head.*

The main stream from Eynhallow Sound passes S. of Gairsa and thence transversely to Stromberry Head, and on through Shapinsha Sound. The tide stream is narrow in its passage between Work Head and Eller Holm, nor does the *String* expand for some distance after

The directions as well as the velocities of the tidal streams in the Pentland Firth vary with the hour of the tide; and in almost every case the flood takes a more southerly direction as the tide grows older, and the contrary with the ebb.

Rate. The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching the entrance. Between Turn Ness and Dunnet Head the usual springs rate is 7 knots, but as they round the South end of Swona and North end of Stroms, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore, the flood stream makes strong along the coast of South Walls, and curving to the northward of Swona, washes the Great Lothar, and passes to the northward of the Pentland Skerries.

At a later period of the tide, the stream from Brims Ness goes direct to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she will pass a mile to the southward of Swona, and the same distance to the southward of the Skerries.

Hoxa Sound. From Cantick Head the flood stream sets past Stangar Head, and crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other runs about 4 knots towards Water and Holm Sounds.

Holm Sound. Through Holm Sound the rate of the stream is 6 knots where strongest, and it turns at one hour after it is high water on the shore. The rate through Water Sound is 4 knots.

Water Sound. From Cantick Head a weak stream runs northwards, filling Long Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest part of these Sounds is 2 knots.

Cantick Sound. Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Swona; but it is almost impossible to predict exactly what direction a drifting vessel would take; with Barth Head open North of Swona, the first quarter flood would send her to the northward of that island, and through the mid-channel between it and South Ronaldsha; but the half flood would probably press her too close to Barth Head, and perhaps on the Great Lothar.

East side of Hoy. The first of the flood stream from Widewall sets direct on Barth Head and the Lothar, so that in light winds vessels should in all cases pass as near to the North Head of Swona as possible. As a general rule, if a ship, having left Widewall with light winds and flood tide, should drift nearer to Swona than Barth Head, she will be likely to clear the Lothar—if nearer to Barth Head, she will go too close to that rock.

Pentland Firth; round Swona ; When the flood stream first makes at the north head of Swona, it first sets across the channel, but presently turns to the southward, passing clear of the Lothar, and then to the northward of the Pentland Skerries; but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide, sets towards them.

Pentland Skerries. Between the Lothar and the Skerries the flood stream sets fair out to sea, about E.S.E., joining the main stream from Stronsa Firth.

From the South end of Swona the first flood sets right on the Great Skerry, dividing there, and running 7 knots close to the North rocks. On the South side the stream sets off (leaving a narrow eddy inside), at first towards the Little Skerry, but it gradually curves and goes clear of

the Clette. A vessel, however, must be very near the Great Skerry to drift in that direction; if only half way between the Great and Little Skerries she would infallibly drive upon the rocks, where the current runs like a mill-stream. It must be observed, that the general tendency of the flood-stream is to set clear to the westward of the Skerries, and that a vessel must be very near the opening between the Great and Little Skerries before she would feel its indraught. After half tide in the stream, the set of flood from Swona goes well clear to the southward of the Pentland Skerries.

I cannot state with the same personal confidence the direction of the streams of tide on the South side of the Pentland Firth, but the experiments of Capt. Otter show that the flood stream from Dunnet Head and St. Johns Point has a tendency to pass to the northward of Stroma, so that a buoy set adrift within half a mile of Mey Bay will not float through Inner Sound, but rather drift on shore on the west side of Stroma; and from this it would appear that a vessel one mile to the northward of Dunnet Head, with strong flood, will go well clear to the northward of Swona.

Inner Sound.

The last of the flood stream is pressed down upon Duncansby Head, where it does not cease running till 4 hours ebb on the shore; for which reason, when a vessel is turning up from the southward, she should rather endeavour to enter the Firth upon the North side, when she will usually be able to get as far as Brough Ness while the flood is still running.

Duncansby Head.

There are large eddies under Stroma and Swona with the flood, and where they meet the main stream little whirlpools are produced, which credulity has exaggerated into objects of importance; on rare occasions they might be dangerous to boats.

Eddies of Swona and Stroma.

It is almost still water to the eastward of the Skerries during flood, and a large eddy is formed between the Great Lothar and Old Head, commencing at half-flood on the shore; it is called Liddel Eddy, from a farm of that name in South Ronaldsha.

Eddies of Pentland Skerries; and Liddel Eddy.

Wherever the tide stream is rapid past any point there is always an eddy on the opposite side, and these eddies increase as the tide grows older, till at last only a narrow stream of the former tide is left; this may be well witnessed in Hoy Sound, where the flood stream is sometimes diminished by the encroaching ebb to 20 and 30 feet in breadth.

The indraught of the ebb stream to the Pentland Firth is felt at a considerable distance from the entrance, so that vessels leaving the Mull of Deerness in calm weather are sometimes drifted into the Pentland Firth. From Copinsha the stream runs nine hours to the southward, from half flood on the shore to low water; but its rate is slow, never exceeding 2 knots, except near Old Head, where it runs four.

Ebb stream,

There is not much danger to be apprehended from the ebb stream in the Pentland Firth when it has made strong; about 3 hours after low water on the shore, it sets fairly through between Duncansby Head and the Skerries, between Swona and Stroma, and over towards Hoy; and a vessel must be far within a line joining Duncansby Head and the North end of Stroma, to feel the indraught of the Inner Sound; for a buoy that has drifted through that Sound with the flood stream will not return with the ebb.

in the Firth.

Inner Sound.

Round Brough Ness the ebb pours with great violence, and over the tail of the Great Lothar, where several vessels have thereby been lost.

Great Lothar.

The stream from the North side of the Pentland Skerry sets upon Swona, dividing upon the South Clette; but the last part of the ebb will go to the northward, between Barth Head and Swona.

Swona.

From the North Head of Swona the first ebb goes towards Brims Ness, the last towards Switha. There is a very large eddy under Swona

Eddy.

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and incloses a large eddy; at half tide these united streams set over toward Turn Ness, where the last of the ebb tide drains, while there is comparatively still water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of the several streams, can learn from the chart.

REMARKS ON THE SET OF THE TIDAL STREAMS IN THE IRISH AND ENGLISH CHANNELS, AND IN THE NORTH SEA.—BY REAR-ADMIRAL F. W. BEECHEY, F.R.S.

*The Common
Standard for
the turn of the
Streams*

A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water along the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover; and to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.); and it is only necessary to mention here, that to the southward of the parallel of Scilly, the tides of the Channel and offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to make the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of their course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolving motion of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, yet directly she is loose she will be carried away upon a rhomb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is more regular, and while the water is *falling* at Dover, will be found setting to the *northward*: near the coast partaking of the direction of the shore, and turning sharply round Trevoise Head and Hartland Point into the Bristol

Channel; and while the water is *rising* at Dover, setting as sharply out of the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; and at Trevoise Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; at present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about the parallel of $51^{\circ}00'$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versâ*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is falling at Liverpool, and *vice versâ*. To the westward of this line the tides appear to be slack; but we are in want of further observations in all this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west round Cape Clear, and *vice versâ*.

Seven Stones.

Meeting of the
Stream in
 $51^{\circ} N.$

Streams between
Scilly and
Tuskar.

Off S. coast of
Ireland.

At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, and N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versâ*, as before stated. The *entrance of* Liverpool is properly the standard to which the turn of the stream in these pages is referred, and wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges Pier, to which the tide tables are adapted.

Off the Smalls.

On the Irish side, at the Saltees Lightship, for instance, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{4}$ hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. for the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

Off the Saltees.

From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore
Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE WHEN AT THEIR GREATEST STRENGTH.

Streams turn with the tides of Liverpool and Morecambe Bay.

IN the Irish Channel, as before observed, experiments have shown that, notwithstanding the variety of times of high water throughout the Channel, the turn of the stream over all that part which may be called the fair navigable portion of the Channel is nearly simultaneous; that the northern and southern streams in both Channels commence and end in all parts (practically speaking) at nearly the same time; and that that time happens to correspond nearly with the time of high and low water on the shore at *the entrance* of Liverpool and of Morecambe Bay,* a spot remarkable as being the point where the opposite tides coming round the extremities of Ireland terminate. So that it is necessary only to know the times of high and low water at either of these places, to determine the hour when the stream of either *tide will commence or terminate in any part of the Channel*. For this purpose the Liverpool tide-table may be used, subtracting 18 minutes from the times there given, in consequence of the high water at St. Georges Pier being later than the point which is considered as the head of the tide, and which will be found fully explained at page 125.

Streams enter N. and S. of Ireland.

The tide from the Atlantic enters the Irish Channel by two channels: of which Carnsore Point, the S.E. point of Ireland, and St. Davids Head, the S.W. point of Wales, are the limits of the southern one; and Rathlin and the Mull of Cantyre the boundaries of the northern.

Southern streams from Tuskar to the Isle of Man.

The *central portion of the stream* of flood or *ingoing* stream, runs nearly in a line from a point midway between the Tuskar and the Bishops, to a position 16 miles due west of Holyhead; beyond which it begins to expand eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes to the eastward with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it is arrested by the flood or southern stream from the North Channel coming round the Point of Ayr, and is first turned round to the eastward by it, and then goes on with it at an easy rate direct for Morecambe Bay; thus changing its direction nearly eight points.

Eastern Branch of S. stream sets into Cardigan Bay.

The *outer portions* of the stream are necessarily deflected from the course of the great body of the water by the impediments of banks on the Irish side of the Channel, and by the tortuous form of the coast on the Welsh. The eastern portion passing Linney Head, rushes with great rapidity between the Smalls, Grassholm, and Milford Haven towards the Bishops, which it passes at a rate of between 4 and 5 knots; sets sharply round those rocks in an E.N.E. direction right over the Bass Bank, and into Cardigan Bay; makes the circuit of that Bay, and sets out again towards Bardsey, at the other extremity of it; then sweeping to the N. by W. past the island and through the Sound, it gradually takes the course of the shore, round Caernarvon Bay, filling the Menai Strait as far as Bangor; but the stream still continuing outside towards the South Stack, which it rounds, setting towards the Skerries at a rate of upwards of 4 knots; and, finally, turns sharp round those rocks for

* The entrances of Liverpool and of Morecambe Bay are, as before stated, 18 minutes earlier in their times of high water, than those given for Liverpool in the tide-tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the obb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

*Western Branch
sets over the
Irish banks.*

*Off Arklow, no
rise or fall.*

Codling Bank.

*Stream ends off
Carlingford.
No stream there.*

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 20 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

*Northern
Stream from
Rathlin to the
Clyde.*

The *central portion* midway between the Mull of Galloway and the Copeland Island, presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

*Central portion
of this stream
sets to Isle of
Man and More-
cambe Bay.*

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

*Western branch
of N. stream to
Maidens and
Belfast.*

dangerous group ; and takes the direction of the coast again from Muck Island to Black Head, at the entrance of the Lough of Belfast, which it fills.

Belfast Lough.

The portion of the stream which sets into Belfast Lough splits off Grey Point ; one portion flowing up towards Garmoye, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. Johns Point ; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed, although pressed upon by streams from various quarters.

Ingoing Streams.

Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams.

The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams.

These observations do not, however, extend beyond the points where the Channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left ; that on the north joining the stream from Jura, and turning sharp round Rathlin ; that on the south, speaking now of the outgoing stream, sweeps past St. Davids Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

TABLE SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.

In the following Table, the direction of the stream as it runs at the middle of the tide or at its greatest strength, is given at four places upon lines connecting well known headlands, viz., at 5 miles from the shore, on each side of the channel, and at a third of the distance across the channel from each of those headlands. The names of the places will be found in the marginal columns; and in the adjacent column, a brief description of the course of the streams in the immediate vicinity of each headland. The western part of the stream will be found on the left-hand page, and the eastern half on the right-hand page. *Explanation.*

To use the table, take the line nearest to your position, and at the distance across the Channel which answers best to your distance from the land, take out the direction of the stream from its column; or if the place of the ship falls between two divisions, take the mean of the two directions given in the columns for the direction of the stream at that time. To know when the stream will turn, look in the Tide Tables for the time of high water at Liverpool, for the day, and about 15 minutes after that time the stream will begin to *set out* in both the North and the South Channels, and will run in that direction until about 45 minutes before low water, when the general slack water begins. The slack water in the offing is usually spread over an interval of an hour—from the cessation of one stream to the beginning of the next.

In these tables { F stands for *flood* or *rising* tide at Liverpool.
E stands for *ebb* or *falling* tide at Liverpool.

As a rough general rule, in the fair way of the Channel a vessel will be carried 9 miles by the stream in a whole tide at springs, and at neaps about 6 miles; but near to the land on either side, or to the banks, the rate of the stream greatly increases.

The rates given in the table which follows are at spring tides; and in order to adapt them to neaps, one third may be subtracted from them.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Tuskar and St. Davids Head.	The stream curves with the land and slacks in shore $1\frac{1}{2}$ hours before the offing, and inside the Long Bank $2\frac{1}{2}$ hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. $\frac{1}{4}$ E. S.W. $\frac{1}{4}$ W.	Rate. 3 3	N. E. by E. S. W. by W.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$	F E
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. $\frac{3}{4}$ N. S.S.W. $\frac{3}{4}$ W.	3.6 3.6	N.E. $\frac{1}{4}$ N. S.W. $\frac{3}{4}$ S.	$3\frac{1}{2}$ $3\frac{1}{2}$	F E
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns $1\frac{1}{2}$ hours before the offing, and 2 hours close in shore.	Kish Light Ship.	N. by E. $\frac{3}{4}$ E. S.S.W.	2.0 2	N. by E. $\frac{3}{4}$ E. S.S.W. $\frac{1}{4}$ W.	$2\frac{1}{2}$ $2\frac{1}{2}$	F E

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs $2\frac{1}{2}$ knots at springs.
At 5 miles ditto ditto 3 to $3\frac{1}{2}$ knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. $\frac{1}{2}$ E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. $\frac{1}{2}$ N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. $\frac{1}{4}$ S. W. by N. $\frac{1}{4}$ N.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$	E. $\frac{1}{4}$ N. W. $\frac{3}{4}$ S.	Rate. $1\frac{1}{2}$ $1\frac{1}{2}$	F F
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. $\frac{3}{4}$ E. S. $\frac{3}{4}$ W.	1.0 $1\frac{1}{2}$	N.E. S. by W. $\frac{1}{4}$ W.	$\frac{1}{2}$ $\frac{1}{2}$	F E

of the TIDAL STREAMS in the IRISH CHANNEL.

of the Stream.					Remarks on the Tides near the Land.	Position.	
	1/2 over.	5 Miles.		From			
F	N.E. 1/4 E.	Rate. 2 1/2	N.E. 1/2 E.	Rate. 3 1/2 to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardi- gan Bay, sweeping more and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.	On a line join- ing St. Davids Head and the Tuskar.
E	S.W. 1/4 W.	2 1/2	S.W. 1/2 W.	4			
F	N.N.E. 3/4 E.	3 1/2	N.N.E.	3	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1 h. 20 m. in the Bardsey Sound before it does in the offing; the flood setting strong into Caernar- von, and the ebb strong into Cardigan Bay, and <i>vice versa</i> ..	On a line join- ing Bardsey Island and the Arklow Light Ship.
E	S.W. by S.	3	S.S.W.	2 1/2			
F	N.N.E. 1/4 E.	2 1/2	N. by E. 1/4 E.	3 1/2	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.	On a line join- ing Holyhead and Kish Light Ship.
E	S.W. 1/4 S.	2 1/2	S.W. 1/4 S.	3			

first quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N. W. and W. S. W. from the lighthouse, according to time of tide; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N. W. winds occasion the heaviest seas; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N. E. by E. 1/2 E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F	E. $\frac{1}{4}$ N.	Rate. 2	E. $\frac{3}{4}$ N.	Rate. 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on	On a line join- ing the Sker- ries and the Calf of Man.
E	W. by S. $\frac{1}{4}$ S.	$1\frac{1}{2}$	W. by S.	3			
thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.							
F	E. by N.	$1\frac{1}{4}$	S.E. by E. $\frac{1}{4}$ E.	2	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the	On a line join- ing the Calf of Man and Rockabill.
E	W. by S. $\frac{1}{4}$ S.	$1\frac{1}{4}$	N.N.W. $\frac{1}{2}$ W.	$1\frac{1}{4}$			
ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.							

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. $\frac{1}{2}$ N. W. $\frac{1}{4}$ N.	Rate. 3 $\frac{1}{4}$ 3 $\frac{1}{4}$		E. $\frac{1}{4}$ N. W. $\frac{1}{4}$ S.	2 F 2 E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs 2 knots at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of 3 $\frac{1}{4}$ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	s.w. by w. $\frac{1}{4}$ w. N.E. $\frac{1}{4}$ E.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$		S.W. $\frac{1}{4}$ W. N.E. $\frac{1}{4}$ N.	0 $\frac{1}{2}$ F Drain E
On a line joining Peel and Mull of Gallo-way.	- - -	Peel -	E. $\frac{3}{4}$ N. W. $\frac{1}{4}$ N.	1 1 $\frac{1}{2}$		E. $\frac{3}{4}$ S. W. by N.	1 $\frac{1}{4}$ F 1 $\frac{1}{4}$ E

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	E.S.E. W. $\frac{3}{4}$ N.	Rate. 3 $\frac{1}{4}$ 3		E. $\frac{1}{4}$ S. W. $\frac{3}{4}$ N.	2 $\frac{1}{2}$ F 3 $\frac{1}{4}$ E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. by E. N.N.W. $\frac{1}{4}$ W.	2 $\frac{1}{2}$ 1 $\frac{1}{2}$		S. by E. N.W. $\frac{3}{4}$ N.	2 $\frac{1}{2}$ F 2

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. $\frac{1}{2}$ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining Copeland Island and Mull of Gal-loway.	- - -	Copeland Island.	S. $\frac{3}{4}$ E. N. $\frac{1}{4}$ W.	Rate. 2 2		S. by E. $\frac{3}{4}$ E. N. by W. $\frac{1}{4}$ W.	2 F 2 $\frac{1}{2}$ E

Magnetic Direction and Rate of the

After High Water at Liverpool.											
1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. $\frac{1}{2}$ E.		North		N. by W. $\frac{1}{4}$ W.		N.W. by N.		N.W. $\frac{1}{4}$ N.		S.W.	

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

of the Stream.					Remarks on the Tides near the Land.	Position.
1 over.		5 Miles.		From		
F S.E. by E. 1/4 E. E W. by N. 3/4 N.	Rate. 1 1/2	S.E. 1/4 S. N.W. 1/4 W.	Rate. 2 2	Walney Island.	The stream sets sharply round Walney Island into Morecambe Bay.	On a line join- ing Walney Island and the Calf of Man.
F S. 3/4 E. E Slack	0 1/2	S. 1/4 W. N. by W.	1 1/4 1 1/4	Peel	To the N.W. of Peel the stream divides; one part runs towards the Calf, the other turns to the N.E., passes Contrary Head, so called from the set of the tides off it, and runs with an increasing rate along the land to Jurby, and thence to the Point of Ayr.	On a line joining Peel and St. Johns Point.
E. by S. 1/4 S. W.N.W.	2 3/4 2 1/4	E. by S. 1/4 S. N.W. by W. 1/4 W.	3 0 3 1/4	Mull of Gal- loway.	Off the Mull of Galloway the stream attains its greatest strength, and occasions a race off the head; but there is usually a slack very close to the shore, of which steamers who are acquainted take advantage. Between the Mull and Burrow Head the stream bends to the northward, and finally takes the curve of the bay of Looe, setting sharply into the bay round the Mull, and out round Burrow Head.	On a line join- ing Mull of Galloway and Peel (Isle of Man).

of the Stream.			Remarks on the Tides near the Land.	Position.	
5 Miles.	From				
F E	East W. by N.	Rate. 4 4	Burrow Head	- - - - -	On a line join- ing Burrow Head and Point of Ayr.
F E	S.E. 3/4 S. N.W.	1 3/4	St. Bees Head	Between King William Bank and St. Bees Head the stream is slack, but near St. Bees begins to run, one part passing up the Solway, the other going on towards Walney.	On a line join- ing St. Bees Head and Point of Ayr.

passes on to Maughold Head, where it meets with the tide from the southern channel. At half flood the stream at the Bahama runs towards Ramsay, and then turns to the north-west the rest of the tide.* A few miles westward of this spot, in latitude 54° 18' N. and longitude 4° W., the streams from the Calf of Man, and that which had passed over the Whitestone Bank, meet and thence run directly for Walney Island.

of the Stream.			Remarks on the Tides near the Land.						Position.
5 Miles.	From								
F S.S.E. $\frac{1}{4}$ E	Rate.	Mull of Gal- loway.	-	-	-	-	-	-	On a line joining Mull of Gallo- way and Cope- land Island.
E N. by W. $\frac{3}{4}$ W.	3		3						

Stream at the Bahama Light Vessel.

Before High Water at Liverpool.									
5 Hours.		4 Hours.		3 Hours.		2 Hours.		1 Hour.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
S. 1/4 W.		S. 1/4 W.		S.W. 1/4 S.		N.W. 1/4 W.		N. by E.	

* See Bahama Light Vessel.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Copeland Islands and Lough of Belfast.

The main body of the stream, ebb and flood, crosses the entrance of this Lough in a curve from the Copeland Islands to Blackhead, and near the islands gains a strength of 5 knots; this curve bends more and more in until it stretches from Whitehead to Grey Point, when it divides, one part of the flood running up to Garmoyle, the other bending back and running towards Orlock, and near that place will carry a vessel upon the Briggs if not guarded against.

The first of the flood sets through the Copeland Sound and between the islands at a rapid rate, and care must be taken not to be swept into the intricate passage between the Copeland Islands. At half tide all the inshore part of the tide within $1\frac{1}{2}$ miles of the coast south of the Copelands slacks, and shortly turns to the northward and runs for 3 hours, whilst the stream in the offing is still going to the southward; so that from Ballyferris Point to Foreland Point, quite close in, the stream runs 9 hours to the northward and only 3 to the southward.

Position.	Remarks on the Tides near the Land.	Magnetic Direction			
		From	5 Miles.	$\frac{1}{2}$ over.	
On a line joining Corsewall Point and Sanda Sound.	Near Corsewall the stream gains strength, and close in takes the curve of the land, the flood setting to the S.W. round the lighthouse, and the ebb <i>versé</i> .	Corsewall Point.	S. $\frac{1}{2}$ E.	Rate. $1\frac{1}{2}$	S.E. $\frac{1}{4}$ S. $1\frac{1}{2}$ F
			N.N.W. $\frac{1}{4}$ W.	$1\frac{1}{4}$	N.W. $\frac{1}{4}$ N. $1\frac{1}{2}$ E
On a line joining Muck Island and Corsewall Point.	Close to Muck Island the stream attains great strength, the flood turning round Blackhead into the Lough of Belfast, but at a few miles off shore it runs straight on for the Copeland Islands.	Muck Island.	S. by E. $\frac{1}{4}$ E.	$1\frac{3}{4}$	S. by E. $\frac{1}{4}$ E. $1\frac{1}{2}$ F
			N. by W. $\frac{1}{4}$ W.	$1\frac{1}{4}$	N. by W. $\frac{1}{4}$ W. $1\frac{1}{2}$ E

The tides off Muck Island run from $3\frac{1}{2}$ to $4\frac{1}{2}$ knots close in, and occasion a race and heavy breaking sea at the springs; and in blowing weather there are races also off both Blackhead and Whitehead, and also the Gobbins; with the *ebb-tide* there is an eddy from half tide, close in with the shore, which may be taken advantage of by steamers at all times, and by sailing-vessels with a leading wind; but it does not extend sufficiently far off for sailing-vessels to benefit by it with a working wind, as they would be in danger of getting on the rocks if they missed stays.

Position.	Remarks on the Tides near the Land.	Magnetic Direction of the Stream.			
		From	$\frac{1}{2}$ over.	$\frac{1}{2}$ over.	
On a line joining Tor Point and Mull of Cantyre.	Close off Tor Point the flood runs upwards of four knots at springs.	Tor Point	S. by E. $\frac{1}{4}$ E.	Rate. 4	S. by E. $\frac{1}{4}$ E. 4 F
			N. by W. $\frac{1}{4}$ W.	$3\frac{1}{4}$	N.N.W. $3\frac{1}{4}$ E

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

The 3rd quarter of the flood having turned to the northward, meets the tide through the Sound off the Deputy Reef, and they jointly strike off for the south end of the Copeland Islands and pass over the Bushes, and thence through the Channel between the Islands.

The eddy under Mew Island at this time rushes with great speed to the N.E. until it meets the true tide, and with it forms a race which sailing-vessels should avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

The last of the flood goes to the northward through the Sound, and splits off the south end of the Copeland, and one part runs for Mew Island, throwing off branches between the islands.

All about the Copeland Islands the eddies are very strong, and at night a vessel should be sure that she is outside the drift of the point of Mew Island.

of the Stream.		Remarks on the Tides near the Land.		Position.
5 Miles.	From			
F. E. by S. $\frac{3}{4}$ S. E N.W. by W. $\frac{1}{4}$ W.	Rate. 2	Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
	$1\frac{3}{4}$			
S. $\frac{1}{2}$ E. N. by W.	$1\frac{1}{4}$	Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.
	$1\frac{1}{2}$			

After passing Whitehead, the tide slacks considerably as you enter the Lough. With the flood there is a strong eddy under Muck Island, which will be found very useful to steamers and even sailing-vessels beating along this coast; with a northerly wind they will do well to keep close in with the shore hereabout, as the strength of the flood strikes off from Muck Island in a S. E. direction, till it meets the stream which passes the eastern side of the Maidens, when it takes a channel direction; the meeting of these two tides appear to have occasioned a deep ditch, which will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.	Position.
Near the Mull of Cantyre the stream runs 5 knots, and occasions a heavy dangerous sea in bad weather; with either tide, quite close in, there is an eddy. From the Mull of Cantyre the flood takes a direction nearly for Sanda Island, and divides off its western end: one part passing inside the island and up Kilbrennen Sound, the other running on for the Clyde.	On a line joining Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

BY CAPTAIN RICHARD HOSKYN, R.N.,
Hydrographic Department, Admiralty,

(Formerly in charge of the Survey on the North-east Coast of Ireland.)

- Rate of tide.* ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{4}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.
- Eddy from Tor Point through the Sound.* On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.
- Eddy on south shore.* To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and true streams.
- Ebb stream.* During the first hour and half, the ebb stream sets round the Rue Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{4}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-more, which may be attended with danger to small vessels.
- Eddy in Church Bay.* The eddy from Church Bay has now forced the main stream into a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.
- Dangerous overfall.*
- Direction of ebb.*
- Flood stream.* The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, and rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the eastward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island; at the junction of the eddy and true streams there are great overfalls off Altacarry Head, and again off the Rue as mentioned above.
- Eddy to eastward of Island.* With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.
- Navigation of Sound.*
- Streams off Bengore Head.* Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

At the Skerry Islets the *ebb stream* sets fair through the anchorage and Sound to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in its passage between Ramore Head and the Carr Rocks, and creating a very troublesome sea.

Streams near the Skerry Islet.

The flood stream sets from Ramore Head towards the Carr Rocks; when the Sound is entered it sets fair through.

In Broad Sound it sets down on the Little Skerry, while the ebb inclines to the northward through the Sound.

At the anchorage under the Great Skerry there is little tide felt, on the flood it is slack water at half tide, on the ebb with the last quarter, while on the north side of the rocks the stream runs with a velocity of 3 knots.

As we proceed to the westward towards Lough Foyle the tide loses much of its strength, north of the mouth of the Bann, 3 miles off shore its average rate at springs is $1\frac{3}{4}$ knots.

To the westward.

There is an eddy tide all the way along the shore from the Skerry Islets to the mouth of the Bann, commencing at half tide, the line of its junction with the main stream being marked by a strong rippling.

Eddy.

Two miles north of Port Stewart the channel stream turns to the eastward 1 hour and 40 minutes after low water at Liverpool, or at high water on the adjoining shore, and to the westward 31 minutes after high water at Liverpool, or three quarters of an hour before low water on the adjoining shore, so that, on this part of the coast, the tide wave (with reference to its head at Liverpool) being nearly reversed, we witness (what to a person watching the rise and fall of the tide on the shore appears at first sight so anomalous) the whole of the ebb stream coming from the ocean, while the flood comes from the opposite quarter.

Off Port Stewart.

High and low water not occasioned by tidal stream,

Referring the tidal stream to the head of the tide at Liverpool, and the varying times of high water to the undulation of the tide wave, this apparent anomaly disappears.

but by tidal wave.

All this coast to the westward of Fair Head is subject to a ground swell, in fine weather the commencement of the east-going stream is made apparent by the sudden appearance of the swell, resuming again a comparative state of quiet when the west-going stream makes.

Ground swell.

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE TIDE AT DOVER.

Streams turn with the tides of Dover.

IN the English Channel, as before stated (page 120), the time of high water *at Dover* is to be taken as the standard, so that whenever either the time of the turn or the direction of the stream is required to be known, the time of the ship is to be compared with the time of high water for the day at the standard place, and the interval sought in the table which accompanies these remarks, and in the column answering to the ship's position will be found the information required.*

Tidal Compartments.

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channels, for the courses of the stream in the mixed tides are so changeable that a very different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, whether N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

1st Compartment.

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining Ushant and Scilly.*

2d Compartment.

The 2d compartment comprises a space eastward of the before-mentioned line from Ushant to Scilly, and as far as a *line joining the Start and the Casquets.* In this part of the Channel there is a mixed tide, partaking of the joint directions of the Channel and Offing streams.

3d Compartment.

The 3d compartment is bounded on the west by the line joining the Casquets and the Start, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets into the true Channel stream which sets straight up and down Channel in the fairway, and will always carry a vessel *towards Beachy Head* while the water is *rising at Dover*, and *from it* while it is *falling there.*

4th Compartment.

The 4th compartment comprises the Gulf of St. Malo, an estuary which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity; and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets sharply *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across and out of* the Gulf, the north-eastern part of the stream sweeping round the Casquets towards Alderney, and through the Russel and other Channels about Guernsey towards the race of Alderney.

5th Compartment.

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the flood tide the western half of the bay is partly in eddy, and the tide slacks in all that part nearly an hour before high water at Dover, whilst in the eastern half of the bay it runs about half an hour longer than at Dover.

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

so that here a ship beating up Channel towards the end of a rising tide at Dover may prolong the tide in her favour by standing close over to the French Coast eastward of Havre. On approaching Boulogne, however, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and are turned down upon the French Coast, so that a ship, which on the English side would at this time have a stream setting straight up Channel, here encounters one upon her beam, sweeping her down towards the Somme, and hence probably the cause of some of the many disastrous losses which have occurred in this part of the Channel.

The 6th compartment is between Beachy Head and the North Fore-^{6th Compart-}land, and the Somme and Dunkerque. In this space the streams from ^{ment.} the Channel and North Sea *meet* while the water is *rising* at Dover, and *separate* while it is *falling* there. The point of union and separation is not, however, stationary, but moves from west to east both on the rising and falling water. For instance, an hour after high water at Dover the separation begins off Beachy Head; in two hours it has reached Hastings, in three hours Rye, and so it creeps on until at low water it has gained the line extending from the North Foreland to Dunkerque. At this time the offing streams on both sides have done, and it is slack water all over the North Sea and English Channel as far as the true tide extends; but the stream does not at this time cease in the intermediate tide. When the water at Dover begins to rise, the stream on either side sets *towards Dover*, and that from the North Sea consequently *goes with the intermediate* tide, which had not yet ceased running to the westward, while the other, the Channel stream, *opposes* it, and this opposition continues throughout the rising tide at Dover; the point of meeting gradually shifting its position eastward as the tide advances on the shore.* About the time when the water at Dover has done rising, the line of meeting has reached the North Foreland, and the streams are now slack over the Channels east and west, leaving the intermediate stream running alone as before to the eastward. The next hour finds the offing streams made down east and west, so that now the intermediate stream falls in with the North Sea stream and goes with it, whilst on the west it separates from the Channel stream, splitting at the same point, Beachy Head, as at first.

Such is the general description of the course and routine of the tidal streams of the English Channel and intermediate tide, a careful perusal of which will enable the reader the more readily to understand the directions and tables annexed.

* The place of *meeting* begins off Beachy Head at *five hours before* high water on the same spot as that of the *separation* at *one hour after* high water; the place of *four hours* before high water is nearly the same as that of the separation at *(two) hours after*; and so on nearly with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every Hour of the TIDE at DOVER.

COMPARTMENT I.

Westward of a Line joining Ushant and the Land's End.

Hours.	North Side of Latitude 49°00 N.						REMARKS.	South Side of 49°00 N.	
	West part.	Rate.	Near Scilly.	Rate.	Seven Stones.	Rate.		West part.	Rate.
After High Water, Dover.	1 W. by N. ¼ N	Greatest rate, springs, 1°50 knots.	N.N.W. ¾ W.	Greatest rate, springs, 1°50 knots.	N. ¼ W.	Greatest rate, springs, 1°00 knots.		W. ¾ S.	Greatest rate, springs, 1°50 knots.
	2 N. ¾ W.		N. ¾ W.		N. by E. ¾ E.			N. by W. ¼ W.	
	3 N.E.		N. by E. ¾ E.		N.E. ¼ N.			E.N.E.	
	4 E.N.E.		N. by E. ¾ E.		N.E. ¼ E.			E.N.E.	
	5 E.N.E.		N.E. ¾ E.		N.E.			N.E. by E. ¼ E.	
	6 E. ¼ S.		East.		E.N.E.			Turning.	
Before High Water, Dover.	5 S.E. by E. ¾ E.	Greatest rate, springs, 1°50 knots.	- - -	Greatest rate, springs, 1°50 knots.	S. ¼ W.	Greatest rate, springs, 1°00 knots.		S. by E. ¾ E.	Greatest rate, springs, 1°50 knots.
	4 S. ¾ E.		S. ¼ E.		S.S.W.			Draining.	
	3 S.S.W. ¼ W.		S.W. ¼ S.		S.S.W. ¼ W.			S.W. ¼ W.	
	2 S.W. ¾ W.		S.W. ¾ W.		S.W. ¾ S.			S.W. ¼ S.	
	1 W.S.W.		S.W. ¾ W.		S.W. by W. ¾ W.			S.W. by W.	

COMPARTMENT II.

Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Iles.

Hours.	North Side of the Channel.						REMARKS.	South Side of the Channel.					
	West part.	Rate.	Centre.	Rate.	East part.	Rate.		West part.	Rate.	Centre.	Rate.	East part.	Rate.
After High Water, Dover.	1 W. by N.	Greatest rate, springs, 2°00 knots.	W. ¼ N.	Greatest rate, springs, 1°50 knots.	W. ¼ N.	Greatest rate, springs, 2°25 knots.	{ W. ¾ S. near Hurd's Deep. }	W. ¾ S.	Greatest rate, springs, 1°50 knots.	W. ½ N.	Greatest rate, springs, 1°50 knots.	W. ¾ S.	Greatest rate, springs, 2°10 knots.
	2 Turning.		W.N.W.		West.			Slack.		W. ¼ S.		W. by S. ¾ S.	
	3 North.		W. ¼ N.		W. ¼ S.			E. ¼ N.		Slack.		S.W. by W. ¾ W.	
	4 E. ¼ S.		Slack.		S. ¼ W.			E. by N. ¼ N.		E. by S. ½ S.		S.E. ¼ S.	
	5 E. ¼ N.		E. ¼ S.		S.E. ¼ S.			E. by N. ¼ N.		E. ¼ S.		S.E. by E. ¼ E.	
	6 E. ¾ S.		E. ¼ S.		E. by S. ¼ S.			E. ¼ N.		S.E. by E. ¼ E.		S.E. ¼ S.	
Before High Water, Dover.	5 E. by S. ¼ S.	Greatest rate, springs, 2°00 knots.	E. ¾ S.	Greatest rate, springs, 1°50 knots.	E. ¾ S.	Greatest rate, springs, 2°25 knots.		East.	Greatest rate, springs, 1°50 knots.	E. ¾ S.	Greatest rate, springs, 1°50 knots.	E. by S. ¾ S.	Greatest rate, springs, 2°10 knots.
	4 Slack.		E. by S.		E. ¼ S.			N.E. by E. ¼ E.		Slack.		E. ¼ N.	
	3 Turning.		Slack.		E. ¼ S.			Slack.		W. by N. ¾ N.		N. ¼ W.	
	2 W. ¾ N.		West.		Turning.			S.W. by W.		Slack.		W. by N.	
	1 W. by S.		West.		W.S.W.			S.W. ¾ W.		W. ¾ N.		N.W. ¾ W.	

COMPARTMENT III.

Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.	Off Cape Barbeur.	Rate.
After High Water, Dover.	1 W. ¼ N.	Greatest rate, flood 2°30 knots, ebb 2°40 knots.	W. by N.	Greatest rate, flood 3°00 knots, ebb 3°10 knots.	Turning.	Greatest rate, flood 3°00 knots, ebb 2°40 knots.		W. ¾ S.	Greatest rate, flood 2°15 knots, ebb 2°40 knots.	N.W. ¾ W.	Greatest rate, flood 2°40 knots, ebb 2°50 knots.
	2 W. by N. ¼ N.		W.N.W.		W. by N. ¼ N.			W. ¾ S.		N.W. ¼ W.	
	3 W. ½ N.		W.N.W.		W. by N.			W. by S.		N.W. ¾ W.	
	4 W. ¼ S.		W. by N. ¾ N.		W. ¼ N.			S.W. by W. ¾ W.		N.W. ¼ W.	
	5 W. ¼ S.		W. by N. ¾ N.		W. ¾ N.			W.S.W.		N.W. ¾ W.	
	6 N.N.E.		W. by N. ¼ N.		W. ¾ N.			Slack.		N.W. ¼ W.	
Before High Water, Dover.	5 East.	Greatest rate, springs.	E. by S. ¾ S.	Greatest rate, springs.	E. by S. ¼ S.	Greatest rate, springs.		E. ¾ S.	Greatest rate, springs.	S.E. ¾ E.	Greatest rate, springs.
	4 E. by S. ½ S.		E.S.E.		E. by S.			E. ¼ S.		S.E. ¾ E.	
	3 E. by S. ¼ S.		E.S.E.		E. by S. ¼ S.			East.		S.E. ¾ E.	
	2 E. by S. ¼ S.		E.S.E.		E. by S. ¼ S.			E. ¼ N.		S.E. ¾ E.	
	1 E. by S. ¼ S.		E. by S. ¾ S.		E. ¼ S.			N.E. by E. ¼ E.		S.E. ¾ E.	

COMPARTMENT IV.

Entrance of Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island

Hours.	12 miles from Brehat Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
	Course.	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W. ¼ W.	Greatest rate, springs, uncertain knots.	W. ¼ N.	Greatest rate, springs, uncertain knots.	"	W. ¼ N.	Greatest rate, springs, uncertain knots.	W. by S.	Greatest rate, springs, knots.	S.W. by W. ¼ W.	Greatest rate, springs, 5 to 7 knots.
	2 S. ¼ W.		South			S.S.W.		S.W.		S.W. by W. ½ W.	
	3 S. ¼ W.		S. ½ W.			S.S.W.		S.W.		S.W. by W. ¼ W.	
	4 S.E.		S.E. by S.			S.E. by E. ¼ E.		S. by E. ¼ E.		S.W. ¼ S.	
	5 S.E.		S.E. by E.			S.E. by E. ¼ E.		S.E. ¼ E.		S.W. ¼ S.	
	6 S.E. ¼ S.		S.E.			S.E. by E. ¼ E.		S.E. ¼ E.		N.E. by E. ¼ E.	
Before High Water, Dover.	5 S.E. ¼ E.	Greatest rate, springs, uncertain knots.	S.E. by E. ¼ E.	Greatest rate, springs, uncertain knots.	"	{ S.E. by E. ¼ E. E. ¼ N. S.E. by E. ¼ E. E. ¼ N. }	Greatest rate, springs, uncertain knots.	E. by N.	Greatest rate, springs, knots.	N.E. by E. ¼ E.	Greatest rate, springs, 5 to 7 knots.
	4 ..		..			..		N.E. ¼ N.		N.E. by E. ¼ E.
	3 N.W. by W. ¼ W.		N.W. ¼ N.			..		N.E. ¼ N.		N.E. ¼ N.	
	2 N.W. by W. ¼ W.		N.W. ¼ W.			N.N.W.		N.E. by E.		N.E. ¼ N.	
	1 N.W. by W.		W. by N. ½ N.			N.N.W.		N.W. ¼ W.		N.E. ¼ N.	

COMPARTMENT V.

In the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

Hours.	West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
After High Water, Dover.	1 N.W. by N.	flood 4:20 ebb 3:40 knots.	W.N.W.	flood 3:20 ebb 3:20 knots.	W. ¼ N.	flood 3:30 ebb 3:00 knots.	
	2 N.N.W. ¼ W.		W.N.W.		W. by S.		
	3 N.N.W. ¼ W.		W.N.W.		W. by N.		
	4 N.W. by N.		W.N.W.		West		
	5 N.N.W.		N.W. by W. ¼ W.		West		
	6 Slack.		N.W. by W. ¼ W.		W. ¼ S.		
Before High Water, Dover.	5 S.S.E. ¼ E.	Greatest rate, springs, -	E.S.E.	Greatest rate, springs, -	W. ¼ S.	Greatest rate, springs, -	
	4 S.S.E. ¼ E.		E.S.E.		E.N.E.		
	3 S.S.E. ¼ E.		E.S.E.		E. by N. ¼ N.		
	2 S.E. ¼ S.		E.S.E.		E. by N. ¼ N.		
	1 S.E. ¼ S.		E.S.E.		E. by N. ¼ N.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and
 " the North Foreland and Dunkerque.

Hours.	REMARKS.	West of	East of	Off Southsand Head.		Off Northsands Head.	
		Line of Separation.		Course.	Rate.	Course.	Rate.
After High Water, Dover.	{ The Tides separate on a line joining— Beachy Head and St. Valery Hastings and Treport Hastings and Cayeux Folkstone and Calais South Foreland and Point Gravelines . . Ramsgate and Nieuport, passing over North Sand Head, the South Line of the Falls, and the banks off Nieuport }	W. ¼ N.	N.E. by E.	N.E.	Greatest rate, springs, 5 3 knots.	N. by E. ¼ E.	
		W. ¼ N.	N.E. by E.	N.E. ¼ E.		N. by E. ¼ E.	
		West	N.E. by E. ¼ E.	N.E. by E. ¼ E.		N.E.	
		W. by S. ¼ S.	N.E. by E. ¼ E.	N.E. by E. ¼ E.		E. ¼ S.	
		S.W. by W.	N.E. by E. ¼ E.				
		W. by S. ¼ S.	{ E. ¼ N. and Northward. }	S.W. ¼ S.		S. by W. ¼ W.	
Before High Water, Dover.	{ The Tides meet on a line joining— Beachy Head and Point Ailly Bexhill and Cayeux, both streams turning down towards the Somme The Tides meet on a line joining Rye and the Somme, passing over the Bassurelle, both tides setting to the Somme The Tides meet on a line joining— Dungeness and Touquet Point Do. Dover and Dunkerque nearly }	Tides meet.			Greatest rate, springs, 5 3 knots.		
		E. by S. ¼ S.	S.W. by W.	S.W. ¼ S.		S. by W. ¼ W.	
		S.S.E. ¼ E.	S. by W.	S.W. ¼ W.		S. by W. ¼ W.	
		S.E. by E. ¼ E.	S.W. ¼ W.	W.S.W.		S. by W. ¼ W.	
		E. by N. ¼ N.	W. by S. ¼ S.	W. ¼ N.		S. by W. ¼ W.	
		N.E. by E. ¼ E.	S.W. by W. ¼ W.	N. by E. ¼ E.		S. by W. ¼ W.	

SECTION III.

TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light and the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
True Stream.]*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at that place*.* This stream sets nearly N.E. and S.W., except near the coasts, where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz., at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, and 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel of 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel of 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel of 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel of 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and the Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly $\frac{1}{4}$ minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGOLAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.

Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles north of North Foreland.		Galloper Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. $\frac{1}{4}$ N.	Greatest rate, springs, 2'50 knots.	Slack.	Greatest rate, springs, 3'00 knots.	N.E. $\frac{1}{4}$ N.	Greatest rate, springs, 2'80 knots.	N.N.W. $\frac{1}{4}$ W.	1'80	N.E. $\frac{1}{4}$ E.	Greatest rate, springs, 2'5 knots.
	2 Slack.		N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.	1'20	N.E. $\frac{1}{4}$ E.	
	3 E. $\frac{1}{4}$ S.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.	1'18	N.E. $\frac{1}{4}$ E.	
	4 East.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		E. by S.	1'46	N.E. $\frac{1}{4}$ E.	
	5 East.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		E. by S.	1'60	N.E. $\frac{1}{4}$ E.	
	6 E. $\frac{1}{4}$ S.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		S.E. $\frac{1}{4}$ E.	1'45	N.E. $\frac{1}{4}$ E.	
Before High Water, Dover.	5 E. $\frac{1}{4}$ S.	Greatest rate, springs, 2'50 knots.	..	Greatest rate, springs, 3'00 knots.	S.W. $\frac{1}{4}$ S.	Greatest rate, springs, 2'80 knots.	S.S.E. $\frac{1}{4}$ E.	1'30	S. $\frac{1}{4}$ W.	Greatest rate, springs, 2'5 knots.
	4 Slack.		S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ W.	1'36	S.W. $\frac{1}{4}$ S.	
	3 W. $\frac{1}{4}$ S.		S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.	1'60	S.W. $\frac{1}{4}$ W.	
	2 W. $\frac{1}{4}$ S.		W. by S. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.	1'65	S.W. by W. $\frac{1}{4}$ W.	
	1 W. $\frac{1}{4}$ S.		W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W. by W. $\frac{1}{4}$ W.	1'40	S.W. by W. $\frac{1}{4}$ W.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hours.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.		
After High Water, Dover.	1 N.E.	Greatest rate, springs, {flood 2'50 } knots, ebb 2'50 }	E.N.E.	Greatest rate, springs, {flood 2'50 to 3'0 } kts., ebb 2'00 to 3'0 }	N.E. by E. ½ E.	Greatest rate, springs, 2'50 to 2'90 knots.	Stream from the Schelde N.W. by W. ¼ W. to 3° E. turning sharply to the N.E. Stream from the Schelde N.W. by W. ¼ W. to 2'30 E. turning sharply to N.N.E. ¼ E.	
	2 N.E. ¼ E.		N.E. by E. ¾ E.		N.E. ¾ E.			
	3 N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ E.			
	4 N.E. by E.		N.E. ¼ E.		N.E. ¼ E.			
	5 N.E. ¼ E.		N.E. ¼ E.		N.E. ¼ E.			
	6 N.E.	N.E. ¼ N.	N.N.E.					
Before High Water, Dover.	5 S.W. ½ S.	Greatest rate, springs, {flood 2'50 } knots, ebb 2'50 }	S.W. by W. ½ W.	Greatest rate, springs, {flood 2'50 to 3'0 } kts., ebb 2'00 to 3'0 }	S.W. by W. ¾ W.	Greatest rate, springs, 2'50 to 2'90 knots.		Stream from the Schelde N.W. by W. ¼ W. to 3° E. turning sharply to the N.E. Stream from the Schelde N.W. by W. ¼ W. to 2'30 E. turning sharply to N.N.E. ¼ E.
	4 S.W. ¼ S.		S.W. ¼ W.		S.W. ½ W.			
	3 S.W. ¼ S.		S.W. ¼ S.		S.W. ¼ W.			
	2 S.W. ¼ S.		S.W. ¼ S.		S.W. ¼ W.			
	1 S.W. ¼ S.		S.W. ¼ S.		S.W.			

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.	REMARKS.	
After High Water, Dover.	Taking the direction of the land, except close to the banks, for which special instructions are necessary.	
1		
2		
3		
4		
5		
Before High Water, Dover.	Taking the direction of the land, except close to the banks, for which special instructions are necessary.	
5		
4		
3		
2		
1		

COMPARTMENT IX.—continued.

Hours.	Shipwash Light Vessel.		Stanford Light Vessel.		St. Nicholas Gat Light Vessel.		Cockle Light Vessel.		Newarp Light Vessel.		Hasborough Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 E.N.E.		N.E. by N		N. ¼ E.		N. by E. ¾ E.		N. ¼ W.		N. by W. ¾ W.	
	2 E.N.E.		N.E. by N.		North -		N. by E. ¾ E.		N. ¼ W.		N. by W. ¾ W.	
	3 E.N.E.		N.E. by N.		North		N. by E. ¾ E.		N. ¼ W.		N. by W. ¾ W.	
	4 E.N.E.		N.E. ¼ N.		N. ¾ W.		N. by E. ¾ E.		N. ¼ W.		N. by W. ¾ W.	
	5 N.E. by E. ½ E.		N.E. ¼ E.		N. by W.		N. by E. ¾ E.		N. ¼ W.		N. by W. ¾ W.	
	6 N.E. ¼ N.		Slack		N. by W. ¼ W.		South on the turn.		North		S. by E. ¾ E.	
Before High Water, Dover.	5 S.W. ¼ W.		S.W. by S.		S. ¼ E.		South		S. ¼ E.		S. by E. ¾ E.	
	4 S.W. by W.		S.W. by S.		S. ½ E.		South		S. ¼ E.		S. by E. ¾ E.	
	3 S.W. by W.		S.W. by S.		S. ¾ W.		South		S. ½ E.		S. by E. ¾ E.	
	2 S.W. by W.		S.S.W. ¾ W.		S. ¼ W.		South		S. ¼ E.		S.S.E. ¼ E.	
	1 S.W. by W.		S.S.W. ½ W.		S. by W.		South		S. ¼ E.		S by E. ¾ E.	

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 N.E. ¾ N.		N.E. ¼ N.		N.E. by N. *		N. by W. ¼ W.		* Turning sharply off for the Leman and Ower.
	2 N.E. ¼ N.		N.E. ¾ N.		N.E. by N.		N. ¼ E.		
	3 N.E. ¼ N.		N.E.		N.N.E.		N.N.E.		
	4 N.E. ¼ N.		N.E. ¼ N.		N.E.		N. ¼ W.		
	5 N.E. ½ N.		N.E. ¼ N.		N.E. ½ N.		N. ¾ W.		
	6 N.E. by N.		N.E. ¼ N.		N.N.E. ¾ E.		N.N.E.		
Before High Water, Dover.	5 S.W. ¾ S.		S.W. ¼ W.		S. ¾ E.		S. ½ W.		Greatest rate, springs, { flood 1'40 } knots. { ebb 1'40 }
	4 S.W. ¼ S.		S.W. by S.		S. ¼ E.		S. ¼ W.		
	3 S.W. ¾ S.		S.W. ¼ S.		S. by W.		S. ¾ W.		
	2 S.W. ¼ S.		S.W. ¾ S.		S.S.W..		S. by W. ¾ W.		
	1 S.W. ¼ W.		S.W. ¼ S.		S.W. ¼ S.		S. by W.		

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 N.E. ¼ N.		Slack.		N.E. ¾ N.		N.E. ¾ N.		Stream setting round Texel south-westerly.
	2 N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		
	3 N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		
	4 N.E. ¾ N.		N.E. ¼ N.		N.E.		N.E. ¼ N.		
	5 N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		
	6 N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		N.E. ¼ N.		
Before High Water, Dover.	5 S.W. ¼ S.		S.W. ¾ S.		S. by E. ¾ E.		S.E. by S.		Greatest rate, springs, { flood 1'70 } knots. { ebb 2'00 }
	4 S.W. ¼ S.		S.W. ¼ S.		S. by W. ¾ W.		S. ¼ E.		
	3 S.W. ¼ S.		S.W. ¼ W.		S.W. ¾ S.		S.W. ¾ S.		
	2 S.W. ¾ S.		S.W. ¼ W.		S.W. ¾ S.		S.W. ¾ S.		
	1 S.W. ¼ S.		S.W.		S.W. ¾ S.		S.W. ¾ S.		

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. $\frac{1}{2}$ E.	Greatest rate, } flood 2.50 } knots. } ebb 3.75 }	N.E. by E. $\frac{3}{4}$ E.	Greatest rate, springs, 3.25 knots.	N. by W. $\frac{3}{4}$ W.	Greatest rate, springs, 2.5 knots.
	2 N.N.W. $\frac{1}{2}$ W.		S.S.W. $\frac{3}{4}$ W.		N.N.W. $\frac{1}{4}$ W.	
	3 -		S.W. $\frac{3}{4}$ S.		N.W. $\frac{1}{2}$ N.	
	4 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		W. by S.	
	5 S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ S.	
	6 S.W. by S.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{2}$ E.	
Before High Water, Dover.	5 S. by E.	Greatest rate, } flood 2.50 } knots. } ebb 3.75 }	S.W. $\frac{1}{4}$ S.	Greatest rate, springs, 3.25 knots.	S.S.E.	Greatest rate, springs, 2.5 knots.
	4 S.S.E.		N.E. $\frac{3}{4}$ E.		S.S.E. $\frac{1}{4}$ E.	
	3 S.S.W.		N.E. by E. $\frac{1}{4}$ E.		S.E. $\frac{1}{4}$ E.	
	2 N. by E.		N.E. by E. $\frac{3}{4}$ E.		E. $\frac{1}{4}$ S.	
	1 N.N.E.		N.E. by E. $\frac{3}{4}$ E.		N.E. $\frac{3}{4}$ N.	

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by W. $\frac{3}{4}$ W.	Greatest rate, 1 knot.	N.N.W. $\frac{3}{4}$ W.	Greatest rate, 1 knot.	N.W. $\frac{1}{2}$ W.	Greatest rate, 1 knot.	W.N.W.	Greatest rate, 1 knot.
	2 N. by W. $\frac{3}{4}$ W.		N.W.		N.W. by W. $\frac{1}{4}$ W.		W. by N. $\frac{1}{2}$ N.	
	3 N.W. $\frac{3}{4}$ N.		N.W. $\frac{1}{2}$ W.		N.W. by W. $\frac{1}{4}$ W.		W. $\frac{3}{4}$ N.	
	4 S. $\frac{3}{4}$ E.		W. by N. $\frac{1}{4}$ N.		N.W. $\frac{1}{2}$ N.		N. by W.	
	5 S. $\frac{3}{4}$ E.		W. $\frac{3}{4}$ S.		N. by W. $\frac{1}{4}$ W.		N.E. $\frac{3}{4}$ N.	
	6 S.S.E. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.		E. by N. $\frac{1}{4}$ N.		E. by N. $\frac{1}{4}$ N.	
Before High Water, Dover.	5 S.E. $\frac{1}{4}$ S.	Greatest rate, 1 knot.	S.E. $\frac{1}{2}$ S.	Greatest rate, 1 knot.	E. by S.	Greatest rate, 1 knot.	E. by N.	Greatest rate, 1 knot.
	4 S.E. by E. $\frac{1}{4}$ E.		S.E. $\frac{1}{2}$ E.		E. by S.		E. $\frac{1}{4}$ S.	
	3 East.		S.E. $\frac{3}{4}$ E.		E. by S.		E. $\frac{3}{4}$ S.	
	2 N.E. $\frac{1}{2}$ N.		S. by E. $\frac{1}{4}$ E.		E. by S. $\frac{1}{4}$ S.		S.E. $\frac{1}{4}$ E.	
	1 N. by E.		E. by N. $\frac{3}{4}$ N.		South.		S. by E. $\frac{3}{4}$ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W.N.W.	Greatest rate, 1 knot.	W. $\frac{3}{4}$ N.	Greatest rate, 1 knot.	W. $\frac{1}{4}$ S.	Greatest rate, 1 knot.	E. by N. $\frac{1}{2}$ N.	Greatest rate, 1 knot.
	2 N.W. by W. $\frac{1}{4}$ W.		W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		N.E. $\frac{1}{4}$ E.	
	3 W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		N.W. $\frac{1}{4}$ W.	
	4 W. by N. $\frac{3}{4}$ N.		W. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.	
	5 W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		N.W. by W. $\frac{1}{4}$ W.	
	6 W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{3}{4}$ N.		W. by N. $\frac{1}{4}$ N.		W. $\frac{3}{4}$ S.	
Before High Water, Dover.	5 E. by S. $\frac{3}{4}$ S.	Greatest rate, 1 knot.	S.E. by E. $\frac{3}{4}$ E.	Greatest rate, 1 knot.	S.S.E. $\frac{3}{4}$ E.	Greatest rate, 1 knot.	W. by S. $\frac{1}{4}$ S.	Greatest rate, 1 knot.
	4 S.E. by E. $\frac{3}{4}$ E.		S.E. by E. $\frac{3}{4}$ E.		S.E. by E. $\frac{3}{4}$ E.		S.S.W.	
	3 S.E. $\frac{3}{4}$ E.		E. by S. $\frac{1}{4}$ S.		S.E. by E. $\frac{3}{4}$ E.		S. by E.	
	2 S.E. $\frac{3}{4}$ E.		E. by S. $\frac{1}{4}$ S.		S.E. by E. $\frac{3}{4}$ E.		S.E. by E. $\frac{1}{4}$ E.	
	1 S.E. by E. $\frac{3}{4}$ E.		E. by S. $\frac{1}{4}$ S.		S.E. by E. $\frac{3}{4}$ E.		E. by N. $\frac{1}{2}$ N.	

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

COMPARTMENT XVII.

On the parallel of 55° N.

Hours.	0° E.		1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.W. $\frac{1}{4}$ W.	$\frac{1}{2}$	Slack.		N. by E. $\frac{3}{4}$ E.		W. $\frac{1}{2}$ S.		N.W. $\frac{1}{4}$ N.	
	2 S. by W.	$\frac{1}{2}$	S.W. $\frac{1}{4}$ W.		s.w. by w. $\frac{1}{4}$ w.		W. $\frac{1}{4}$ N.		N.W. $\frac{1}{4}$ W.	
	3 S. by E. $\frac{1}{4}$ E.	$1\frac{1}{2}$	S.S.W. $\frac{1}{4}$ W.		W.S.W.		W. $\frac{1}{4}$ N.		N.W. $\frac{1}{4}$ W.	
	4 S. $\frac{1}{2}$ E.	1	S. by W.		S.W. $\frac{1}{4}$ W.		s.w. by w. $\frac{1}{4}$ w.		N.W. $\frac{1}{4}$ W.	
	5 S. by E.	$\frac{1}{2}$	S. by W.		S. $\frac{1}{2}$ E.		S.W. by W. $\frac{1}{4}$ W.		W. $\frac{1}{4}$ S.	
	6 S. $\frac{1}{2}$ E.	$\frac{1}{2}$	South.		S.S.E.		S. by E. $\frac{1}{4}$ E.		S.E. by S.	
Before High Water, Dover.	5 S.E. $\frac{1}{4}$ S.	$\frac{1}{2}$	S. $\frac{1}{2}$ E.		E. by S. $\frac{1}{4}$ S.		S. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{4}$ E.	
	4 N.N.E. $\frac{1}{4}$ E.	$\frac{1}{2}$	E. by N. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ S.		S.E. by E. $\frac{1}{4}$ E.		E.S.E.	
	3 N. $\frac{1}{2}$ W.	$1\frac{1}{2}$	N. by E.		E. by N. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ S.		E. $\frac{1}{4}$ S.	
	2 N. $\frac{1}{4}$ W.	1	N. by E. $\frac{1}{4}$ E.		E. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ S.		E. $\frac{1}{4}$ N.	
	1 N. $\frac{1}{2}$ W.	$\frac{1}{2}$	N. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		N. by E. $\frac{1}{4}$ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. $\frac{1}{4}$ W.		W. $\frac{1}{4}$ N.		W. by N. $\frac{1}{4}$ N.		N. by W. $\frac{1}{4}$ W.	
	2 W. by N. $\frac{1}{4}$ N.		W. by N. $\frac{1}{4}$ N.		W. by N. $\frac{1}{4}$ N.		N. by W. $\frac{1}{4}$ W.	
	3 W. by N. $\frac{1}{4}$ N.		W.N.W.		N.W. by W. $\frac{1}{4}$ W.		N.W. $\frac{1}{4}$ N.	
	4 W.N.W.		W. by N. $\frac{1}{4}$ N.		W. by N.		N.N.W. $\frac{1}{4}$ W.	
	5 W. $\frac{1}{2}$ N.		W. by N. $\frac{1}{4}$ N.		W. $\frac{1}{4}$ N.		N.W. $\frac{1}{4}$ W.	
	6 Turning.		N.W. by W. $\frac{1}{4}$ W.		W. $\frac{1}{4}$ S.		N.W. by W. $\frac{1}{4}$ W.	
Before High Water, Dover.	5 E. $\frac{1}{2}$ S.		S.E. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		W. $\frac{1}{4}$ S.	
	4 E. by S. $\frac{1}{4}$ S.		S.E. $\frac{1}{4}$ S.		S. $\frac{1}{2}$ E.		S. by W. $\frac{1}{4}$ W.	
	3 E. by S. $\frac{1}{4}$ S.		S.E. by S.		S.E. by S.		S. $\frac{1}{4}$ W.	
	2 E. by S. $\frac{1}{4}$ S.		S.S.E. $\frac{1}{4}$ E.		S.E. $\frac{1}{4}$ S.		S. $\frac{1}{2}$ E.	
	1 E. $\frac{1}{2}$ S.		S.S.E. $\frac{1}{4}$ E.		S.E. $\frac{1}{4}$ S.		S. by E. $\frac{1}{4}$ E.	

COMPARTMENT XVIII.

On the parallel of 56° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.E.		Slack.		N.W. $\frac{1}{4}$ W.		N. $\frac{1}{4}$ E.	
	2 Slack.		S.W. $\frac{1}{4}$ W.		W. by N. $\frac{1}{4}$ N.		N.N.W. $\frac{1}{4}$ W.	
	3 S. $\frac{1}{4}$ W.		S.W.		N.W.		N.W. $\frac{1}{4}$ W.	
	4 S. $\frac{1}{2}$ E.		W. by S. $\frac{1}{4}$ S.		N.W. $\frac{1}{4}$ W.		N.E.	
	5 S. $\frac{1}{2}$ E.		S. by E.		N.N.W.		N.E. by E.	
	6 S. $\frac{1}{4}$ E.		S. by E.		N. $\frac{1}{4}$ W.		E. $\frac{1}{4}$ S.	
Before High Water, Dover.	5 E.S.E.		E. $\frac{1}{4}$ S.		N. by E. $\frac{1}{4}$ E.		E. by N.	
	4 N.E. by E.		E.N.E.		N.E. $\frac{1}{4}$ E.		E. by N.	
	3 N.E. by N.		N.E. by E. $\frac{1}{4}$ E.		E. $\frac{1}{4}$ N.		N.E. by E. $\frac{1}{4}$ E.	
	2 N.N.E. $\frac{1}{4}$ E.		N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		E.N.E.	
	1 N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		N.E. by E. $\frac{1}{4}$ E.	

COMPARTMENT XVIII—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 Turning.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 E.N.E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	1 N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2 W. $\frac{1}{2}$ S.		2 N.N.W. $\frac{1}{2}$ W.		2 N.N.E. $\frac{1}{2}$ E.		2 N. $\frac{1}{2}$ E.	
	3 N.W. $\frac{1}{2}$ N.		3 N.N.W. $\frac{1}{2}$ W.		3 N. $\frac{1}{2}$ E.		3 N. $\frac{1}{2}$ W.	
	4 N.N.W.		4 N.N.W.		4 N. $\frac{1}{2}$ W.		4 N. by W. $\frac{1}{2}$ W.	
	5 N.N.E. $\frac{1}{2}$ E.		5 N. $\frac{1}{2}$ W.		5 N. $\frac{1}{2}$ W.		5 N. by W. $\frac{1}{2}$ W.	
	6 N.E. $\frac{1}{2}$ E.		6 N. by E. $\frac{1}{2}$ E.		6 N. by W. $\frac{1}{2}$ W.		6 N. by W. $\frac{1}{2}$ W.	
Before High Water, Dover.	5 E. by N. $\frac{1}{2}$ N.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	5 N.E. by E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	5 N. by W. $\frac{1}{2}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	5 N.N.W. $\frac{1}{2}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	4 N.E. by E. $\frac{1}{2}$ E.		4 E. by N. $\frac{1}{2}$ N.		4 N.E. $\frac{1}{2}$ E.		4 N. $\frac{1}{2}$ E.	
	3 E. by N. $\frac{1}{2}$ N.		3 E. $\frac{1}{2}$ N.		3 E. $\frac{1}{2}$ S.		3 S. $\frac{1}{2}$ W.	
	2 E. $\frac{1}{2}$ N.		2 E. $\frac{1}{2}$ S.		2 E. $\frac{1}{2}$ S.		2 S. by W. $\frac{1}{2}$ W.	
	1 E. $\frac{1}{2}$ N.		1 E. $\frac{1}{2}$ S.		1 S.E. by E.		1 S.W. $\frac{1}{2}$ W.	

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	2° W.		1° W.		0°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{2}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	1 S. by W. $\frac{1}{2}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	1 S. by W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.S.W. $\frac{1}{2}$ W.		2 S.W. $\frac{1}{2}$ S.		2 S. by W. $\frac{1}{2}$ W.	
	3 S.W. $\frac{1}{2}$ W.		3 S.W. $\frac{1}{2}$ S.		3 S. $\frac{1}{2}$ W.	
	4 N. $\frac{1}{2}$ W.		4 W.S.W.		4 S. $\frac{1}{2}$ W.	
	5 Slack.		5 Slack.		5 S. $\frac{1}{2}$ E.	
	6 N.N.E. $\frac{1}{2}$ E.		6 N. by E.		6 Slack.	
Before High Water, Dover.	5 N.E. by N.	Greatest rate $1\frac{1}{2}$ knots at half tide.	5 N. by E. $\frac{1}{2}$ E.	Greatest rate $1\frac{1}{2}$ knots at half tide.	5 N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N.E. $\frac{1}{2}$ N.		4 N. by E. $\frac{1}{2}$ E.		4 N. $\frac{1}{2}$ E.	
	3 N.N.E. $\frac{1}{2}$ E.		3 N.N.E. $\frac{1}{2}$ E.		3 N. by E. $\frac{1}{2}$ E.	
	2 N.N.E. $\frac{1}{2}$ E.		2 N.E. $\frac{1}{2}$ N.		2 N.N.E.	
	1 S. $\frac{1}{2}$ E.		1 N.E. by E. $\frac{1}{2}$ E.		1 N. by E. $\frac{1}{2}$ E.	

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 N. by E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S.S.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	1 S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.W. by S.		2 S. by E.		2 S. $\frac{1}{2}$ E.		2 N.W. by W. $\frac{1}{2}$ W.	
	3 S.S.W. $\frac{1}{2}$ W.		3 S. by E. $\frac{1}{2}$ E.		3 S. by W.		3 W.N.W. $\frac{1}{2}$ W.	
	4 S.W. $\frac{1}{2}$ S.		4 S.E. $\frac{1}{2}$ S.		4 S.W. by W. $\frac{1}{2}$ W.		4 N. by W. $\frac{1}{2}$ W.	
	5 Slack.		5 E. $\frac{1}{2}$ S.		5 Slack.		5 N. by W. $\frac{1}{2}$ W.	
	6 N.E.		6 E. by N.		6 Slack.		6 N. $\frac{1}{2}$ E.	
Before High Water, Dover.	5 N.E.	Greatest rate $\frac{1}{2}$ knot about half tide.	5 E. $\frac{1}{2}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	5 Turning.	Greatest rate $\frac{1}{2}$ knot about half tide.	5 N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N.E. $\frac{1}{2}$ E.		4 E. by N. $\frac{1}{2}$ N.		4 N.N.E. $\frac{1}{2}$ E.		4 N.E. by N.	
	3 E.N.E.		3 E. $\frac{1}{2}$ N.		3 N.E. $\frac{1}{2}$ E.		3 N.E. by E.	
	2 E.N.E.		2 E. $\frac{1}{2}$ N.		2 E. by N. $\frac{1}{2}$ N.		2 N.E. by E. $\frac{1}{2}$ E.	
	1 Slack.		1 S. by E.		1 E.S.E.		1 E. $\frac{1}{2}$ S.	

COMPARTMENT XIX.—continued.

Hours.	5°		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. ¼ E.	Greatest rate 1½ knot about half tide.	S. by E. ¼ E.	Greatest rate ¾ knot about half tide.	N.E. by E. ¼ E.	Greatest rate ¾ knot about half tide.	S.S.E. ¼ E.	Rate 0·9 knot.
	2 N.N.E. ¾ E.		S. ¼ E.		E. by N. ¾ N.		Slack.	
	3 S.W. ¼ S.		S. ¾ W. :		N.E. by E. ¼ E.		N.N.E. ¾ E.	
	4 N.N.W. ¼ W.		N. by E. ¾ E.		N.E. by E. ¾ E.		N.E. by N.	
	5 N. by W.		N. ¼ W.		N.E. by E. ¾ E.		N. ¼ W.	
	6 N. by E. ¾ E.		N. ¾ W.		N. by E. ¾ E.		N. ¾ E.	
Before High Water, Dover.	5 N.E. ¼ N.	Greatest rate ¾ knot about half tide.	N. ¾ E.	Greatest rate ¾ knot about half tide.	N.E. by N.	Greatest rate ¾ knot about half tide.	N.E.	
	4 N.E. ¼ N.		N.N.E. ¾ E.		N.N.E. ¾ E.		N.N.E. ¾ E.	
	3 N.E.		N.E. ¼ E.		N.E. ¼ N.		N.E. by E. ¼ E.	
	2 E. by N.		E. by N. ¾ N.		N.E. ¼ N.		N.E. by E. ¼ E.	
	1 E. ¼ N.		E. by N. ¾ N.		N.E. ¼ N.		E. by N. ¾ N.	

COMPARTMENT XX.
On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S. ¼ E.	Greatest rate 1 knot about half tide.	S.E. ¼ E.	Greatest rate 0·6 knot about half tide.	S. by W. ¾ W.	Greatest rate 1 knot about half tide.		
	2 S.E. ¼ S.		S.E. ¼ E.		S. by W. ¾ W.			
	3 E. ¼ N.		S. ¼ E.		S. by W. ¾ W.			
	4 E. ¾ S.		S.E. ¼ S.		Slack.			
	5 Slack.		Slack.		N.W. by N.			
	6 S.W. ¼ S. 1		N. by W. ¼ W.		N. by E. ¾ E.			
Before High Water, Dover.	5 West.	Greatest rate 1 knot about half tide.	N.W. ¾ W.	Greatest rate 1 knot about half tide.	N.N.E. ¾ E.	Greatest rate 1 knot about half tide.		
	4 W. by N. ¾ N.		N.W. ¼ W.		N.E. ¼ N.			
	3 N.W. by W. ¾ W.		N.W. ¾ N.		N.E. ¼ E.			
	2 W. ¾ N.		West		S.S.E. ¾ E.			
	1 W. ¼ N.		S. by E.		S.S.E. ¼ E.			

Hours.	1° E.		2° E.		3° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. ¼ S.	Greatest rate ¾ knot about half tide.	S.W. ¼ S.	Greatest rate ¾ knot about half tide.	S. by E. ¼ E.	
	2 W. ¼ S.		S.W. by W. ¾ W.		S. ¼ E.	
	3 Slack.		W. by N. ¾ N.		South.	
	4 Slack.		N.W. ¼ N.		S. by W. ¾ W.	
	5 N. by E. ¾ E.		N. ¼ E.		S. ¼ W.	
	6 N. by E. ¾ E.		N. ¾ E.		E. by N. ¾ N.	
Before High Water, Dover.	5 N. by E. ¾ E.	Greatest rate ¾ knot about half tide.	N. ¾ E.	Greatest rate ¾ knot about half tide.	N.E. by E. ¾ E.	
	4 N. by E. ¾ E.		N. by E.		N.E. by E. ¾ E.	
	3 N. by E. ¾ E.		N. ¾ E.		E. by N. ¾ N.	
	2 Turning.		N.E. ¼ E.		E. by S. ¼ S.	
	1 W. by N. ¼ N.		S.E. ¼ E.		S.E. by E. ¼ E.	

TIDAL STREAMS.

COMPARTMENT XXI

On the parallel of 59° N.

Hours.	2° W.		1°		•	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{2}$ W.	Greatest rate 1 knot about half tide.	S.S.W. $\frac{1}{2}$ W.	Greatest rate 0.6 knot about half tide.	S.W. by W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S. by W. $\frac{1}{2}$ W.		S.S.W. $\frac{1}{2}$ W.		W. by S. $\frac{1}{2}$ S.	
	3 S. $\frac{1}{2}$ W.		S.S.W. $\frac{1}{2}$ W.		N. by E. $\frac{1}{2}$ E.	
	4 S.W. by W. $\frac{1}{2}$ W.		Slack.		N.E. $\frac{1}{2}$ N.	
	5 W. $\frac{1}{2}$ N.		Slack.		N.E.	
	6 N.W. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ E.		N.E. $\frac{1}{2}$ E.	
Before High Water, Dover.	5 N.W. by N.	Greatest rate 1 knot about half tide.	N.N.W. $\frac{1}{2}$ W.	Greatest rate 0.6 knot about half tide.	N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N.W. $\frac{1}{2}$ N.		N.N.W. $\frac{1}{2}$ W.		E. by N. $\frac{1}{2}$ N.	
	3 W. by N. $\frac{1}{2}$ N.		N.W. $\frac{1}{2}$ N.		S.E. $\frac{1}{2}$ E.	
	2 S.W. by W. $\frac{1}{2}$ W.		S.W. by W.		S.S.W. $\frac{1}{2}$ W.	
	1 S.W.		S.W. by S.		S.W. by W. $\frac{1}{2}$ W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS;
WITH THE RISE OF THE TIDE
AT SPRINGS AND NEAPS.

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Bellingshausen, Krusenstern, Lisiansky, and Lütke of the Russian Navy.

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

• TIME

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PRINCIPAL PLACES ON THE GLOBE ;

ARRANGED ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE ;

*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.		
		Springs.	Neaps.			Springs.	Neaps.	
<i>England, South Coast.</i>								
	h. m.	ft.	ft.		h. m.	ft.	ft.	
Scilly IIs. (St. Agnes)	4 30	16	12	Teignmouth	-	6 0	13	9½
—— (St. Mary)	4 18	15½	11½	Torbay	-	6 0	13½	10
—— (Trescow)	4 22	16½	12½	Exmouth	-	6 21	12½	8½
Penzance	4 30	16½	12½	Lyme Regis	-	6 21	11½	8½
Lizard (Perran } Vose Cove) - }	5 0	14½	10½	Bridport	-	6 5	11½	7½
Coverack	4 35	14½	11½	Chesilton	-	6 13	10½	7
Helford (entrance)	4 43	15½	11½	Portland Breakwater	-	7 1	6½	4½
Falmouth	4 57	16	12	Poole	- {	9 10	6½	4½
—— Truro }	5 5	10	6	Christchurch	- {	9 0	5	
(Town Quay) - }	5 5	10	6	Needles Point	-	9 46	7½	5
Mevagizey	5 4	15½	12	Hurst, Camber	- {	10 0	7½	6
Fowey	5 14	15	11½	Yarmouth	- {	10 0	7	6½
East Looe	5 26	16	13	West Cowes	- {	10 45	12½	9½
Plymouth Breakwater	5 37	15½	11½	Lymington	- {	10 25	8	6
—— Sutton }	5 32	15½	11½	Beaulieu	- {	12 15	10	8½
Pool	5 32	15½	11½	Calshot	- {	11 30	13	9½
Devonport Dk. Yard	5 43	15½	11½	(Castle Point)	- {	10 30	13	9½
Saltash, R. Tamar	5 45	15	11	Southampton	- {	12 45	13	9½
Cargreen	5 47	14½	10½	—— Red-	- {	10 42	8½	6
Pentillie	5 55	13½	9½	bridge	- {	12 57	12½	10
Calstock	6 6	12½	8½	Portsmouth Dock	- {	11 41	13½	10½
Morewellham	6 12	10½	6½	Yard	- {	11 46	6½†	4†
Weir Head	6 17	5½	1½	Port-	- {			
Warleigh Quay, }	5 47	14½	10½	chester (off the	- {			
R. Tavy }	5 47	14½	10½	Castle)	- {			
Maristow	5 47	8½	4½	—— Ports-	- {			
Bigbury B., R. Yealm	5 37	16½	11½	bridge (a ½ mile	- {			
—— R. Erme	5 40	16½	11½	W. of bridge)	- {			
—— R. Avon	5 47	16½	11½					
Bolt Head	5 45	15?	11?					
Salcombe	5 41	15	11½					
—— Kings-	5 46	10						
bridge	5 46	10						
Dartmouth	6 16	14½	10½					

* By the Rise of the tide is meant its vertical rise above the mean low water level of spring-tides.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Portsmouth Fare- ham (in Chan- nel close to the Upper Quay) -	h. m. 11 48	ft. 11½	ft. 8½	Milford (St. Ann } Lighthouse) - }	h. m. 5 56	ft. 24	ft. 18
Bridge -	11 51	7½	4½	Pembroke Dk. Yard	6 12	21	15½
Ryde -	11 20	13½		Benton Castle, }	6 23	20	14½
Bembridge Point -	11 0	14	10½	Cleddau R. }	6 27	20	14½
Chichester -	11 30	14	11	Landshipping „	6 31	19	13½
Pagham (entrance)	11 30	16½	12½	LittleMilfordQuay „	6 42	7½	2½
Selsea Bill -	11 45	16½	12½	Haverfordwest „	6 0	21	
Littlehampton -	11 36	16	11½	Smalls Lighthouse „	6 0	17	
Arundel (Bar) -	11 35	16	11½	Ramsay Sound -	6 0	17	
Arundel (Town) -	12 25			Fishguard -	6 56	11½	8½
Shoreham -	11 34	18	13½	Newport -	7 0	12	9
Brighton -	11 15	19½	16	Cardigan -	7 1	12	9
Newhaven -	11 51	20	15	New Quay -	7 30	15	
Beachy Head -	11 20	20	15	Aberystwyth -	7 31	13½	10
Hastings -	10 53	24	17½	Aberdovey -	8 0	15	
Rye Bay -	11 20	22	17½	Sarn-y-bwch Reef-	7 40	14	
Dungeness -	10 45	21½	19	Barmouth -	7 41	17	13½
Folkstone -	11 7	20	16½	Sarn Badrig -	7 30	13	
Dover -	11 12	18½	15	Port Madoc -	7 30	17	
Deal -	11 15	16	12½	St. Tudwall Road -	7 45	14	
Ramsgate -	11 44	15	12	Pwllheli -	7 46	13½	9½
<i>England and Wales, West Coast.</i>				Bardsey Id. -	7 40	15	
Scilly Isles -	4 30	16	12	Porth-dyn-lleyn -	8 30	16	
(St. Agnes) }				Caernarvon -	9 33	13½	10½
Scilly Isles -	4 27	16	12	Holyhead -	10 11	16	12½
(St. Mary) }				Amlwch -	10 30	18½	13½
Cape Cornwall -	4 35	18½	13½	Beaumaris -	10 32	21½	16½
St. Ives -	4 44	21	15	Air Point, R. Dee	10 54	25	19
Padstow -	5 13	20½	16½	Chester (Crane }	12 16	26	
Boscastle -	5 15	25	17½	Wharf) - }			
Budehaven -	5 45	23	17	Liverpool -	11 23	26	20½
Lundy Island -	5 15	27	20	Formby Point -	10 35	28	
Barnstaple (Bar) -	5 30	19	14	Ribble Lighthouse	10 51	24	17
Barnstaple (Bridge)	6 28	10½	7½	Preston -	11 49	10	4½
Appledore -	5 58	23	16½	Fleetwood (Wyre Lt)	11 11	27	20½
Bideford -	6 7	16	12	„ (Port)	11 12	26½	19½
Ilfracombe -	5 42	27½	21½	Lancaster -	11 16	8½	
Minehead -	6 30	35	26½	Poulton-le-Sands -	11 26	27½	21½
Bridgewater Bar -	6 50	35	26½	Piel Harbour (Pier)	11 5	28	21
Weston-super-mare	6 54	37	28½	Whitehaven -	11 14	23½	18½
Flatholm Islands -	6 54	37½	28½	Port Harrington -	11 5	26	19
Portishead -	7 16	41½	31	Workington -	11 4	20	15
Bristol (King Road)	6 56	44	33	Maryport -	11 3	18	13
Chepstow -	7 30	38	28½	Abbey Head -	11 10	23	17½
Newport -	7 10	38	29	Southernness -	11 20	28	
Cardiff (Penarth) -	6 56	37½	29	Annan Foot -	11 56	20	14
Barry Island -	6 39	35½	26	Port Carlisle -	12 10	20	14
Nash Point -	6 25	33	25	Point of Ayr -	11 7	20½	16½
Swansea (Mum- }	6 1	27½	20½	Douglas, I. of Man	11 12	20½	16
bles Lighthouse) }				Ramsey „	11 12	19½	16
Porthcawl -	6 8	28½	21½	Peel „	11 8	16½	13
Burry Port -	6 1	25½	18½	Calf Sound „	11 17	16½	13
Ferry Side -	5 49	23	16½	Port St. Mary „	11 10	20	16
Llanelly (Bar) -	6 16	28	21	Castletown „	11 10	20	16
Caermarthen (Bar)	6 10	26	19½	<i>Scotland, West Coast.</i>			
Caldy Road -	6 0	27	20	Solway (Tarn Point)	11 22	23	18
Tenby -	6 0	27	20	Kirkcudbright -	11 10	23	
				Newton Stewart }	12 0	12	6
				(Carty Quay) - }			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wigton - -	11 30			Duart, I. of Mull -	5 0	12	10
Garliestown -		17	12	Loch Aline - -	5 33	13½	10½
Port William -	11 10	18	10	Tobermory, Mull I.	5 36	13	9½
Mull of Galloway -	11 15	15½	12½	Loch Cuan - -	5 36	13	9½
Port Patrick -	11 10	15	12	Strontian, L. Sunart	5 40	13½	
Loch Ryan - -	11 12	11	8	Iona Sound - -	5 11	11½	8½
Mull of Cantyre -	10 35	4		Bunessan - -	5 24	12	8½
Campbellton -	11 45	8½	6	Loch Tuadh (Go-			
East Loch Tar-				metra) I. of Mull }	5 29	11½	8
bert, Argyleshire }	11 53	9		Scarnish, Tiree I.	5 31	12	9
Lamlash - -	11 49	10	7	Arinagour, Coll I.	5 41	12½	9½
Ayr - -	11 50	8½	7½	Loch Moidart -	5 44	13½	9½
Troon - -	11 50	10	7½	Eigg Island - -	6 15	14	10
Ardrossan - -	11 45	10	8	Arasaig - -	5 50	13½	10
Garroch Head -	11 49	10		Loch Nevis - -	5 47	14½	10
Millport, Great }				Loch Hourn - -	5 45	13½	10½
Cumbræ - -	11 50	10	6	Ornsay, I. of Skye	5 50	14½	10½
Largs - -	11 50	10		Kyle Rhea - -	6 0	15	11
Greenock - -	0 8	9½	8½	Loch Duich - -	6 0	15½	11
Port Glasgow -	0 18	9		Loch Alsh (Kyle }			
Dumbarton - -	0 20	9		Akin) - -	6 16	15½	11
Bowling - -	0 39	9		Loch Carron }			
Renfrew (Canal Ent.)	1 15	9		(Plockton) - }	6 29	16½	11½
Glasgow - -	1 25	9	7½	Portree, I. of Skye	6 32	15	10½
Loch Long - -	12 6	12		South Rona, Light }			
Loch Goil - -	12 6	10	6	House - -	6 20	14½	10½
Loch Strivan -	11 55	6		Loch Torridon -	6 20	15	11
Burnt Isles, Kyles }				Barra, North Harb.	5 48	11½	8½
of Bute - -	11 50	10	8	" Castle Bay -	5 44	11½	8½
Skip Ness - -	11 50	9	6	" Head, Ber-			
Ardrihaig, L. Fyne	11 53	9	7½	nera Id. }	5 45	11½	7
Inverary - -	12 0	10		Canna Island -	6 19	14	9½
Gigha Sound -	2 22	4	2½	Loch Boisdale, }			
West Loch Tar-				South Uist - }	5 47	12½	9½
bert, Argyleshire }	2 30	1-4		Benbecula - -	6 3	11½	8½
Port Ellen, Islay -	5 0	5	4	Loch Skipport -	5 52	12½	9
Jura, Feolin Ferry	4 41	6½	4½	Loch Dunvegan }			
" Small Isles -	5 3	3½	2½	(Dunvegan Cas-	6 7	15½	11
Crinan - -	4 49	6½	5	tle, I. of Skye) }			
Noamh Island -	5 2	11½	7	Kallin, North Uist	5 59	13½	9½
Colonsay (Schal-				Monach Is. (Shillay)	5 44	12½	8½
lasaig) - -	5 18	11	7½	Loch Eport, N. Uist	6 6	12½	9½
Carsaig - -	5 28	10	7½	Loch Maddy, N. Uist	6 6	12½	9½
Easdale Sound -	5 10	10-12		Vallay - -	6 10	11½	8½
Ardintallan, Loch }				Berneray I. (Sound }			
Feochan - -	5 31	9	6½	of Harris) - }	6 11	13	9½
Oban - -	5 22	12	9½	Obb of Harris -	6 16	11½	8½
Stonefield, Loch Etive	7 3			East Loch Tar-			
Bunawe - -	7 54	5½		bert, Harris Id. }	6 10	13½	10
Port Appin, Loch }				W. Loch Tarbert, "	6 4	11½	8½
Linnhe - -	5 26	12½	8½	Loch Seaforth }			
Corran, Loch }				(Athline) - }	6 16	15	10
Linnhe - -	6 37	14½		Loch Clay - -	6 9	14½	9½
Ballachulish, }				Loch Ewe (Poolewe)	6 39	14½	10½
Loch Leven }	5 43	11		Loch Broom }			
" Head of Loch	6 28			(Ullapool) - }	6 40	14½	10½
Corran, Loch Aber	5 43	12	8½	Gruinard Id. -	6 37	14½	
Corpach - -	5 59	11½		Tanera, Summer I.	6 37	14	10½
Loch Eil (Head of }				Loch Inver - -	6 40	14	11
Loch) - -	6 27			Loch Harport -	5 54	13½	10

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Loch Erisort, }				Tay River (Bar) -	2 6	16	14
Lewis Id. - }	6 43	15½	11½	Broughty Ferry -	2 22	14½	11
Stornoway -	6 46	13½	9½	Dundee -	2 32	14½	11½
Loch Roag (Ber- }				Perth -	3 35		
nera) Lewis I. - }	6 11	11	8	Cockenzie, Firth of }			
St. Kilda -	5 30			Forth - }	2 16	15½	13
Rockall -	3 30	12		Leith -	2 17	16½	12½
Loch Laxford -	6 44	15	11½	Granton Pier -	2 20	16	12½
Cape Wrath -	7 30	15½		Burntisland -	2 24	16½	12½
Loch Eriboll -	7 43	14½	11	Queensferry -	2 37	18	14
Loch Tongue -	7 53	15	12	Kincardine -	2 53	17½	15
Thurso -	8 28	13½	9½	Alloa -	3 18	17½	15
Stroma, S. side -	9 47	7½	6	Stirling -	3 52	7½	4½
Swona, E. side -	10 24	10	7½	Dunbar -	2 8	14½	11
" W. side -	9 35	10	7	Eyemouth -	2 15	15½	11½
Great Skerry, }				Berwick -	2 18	15	11½
E. side - }	11 4	7½	6½				
" W. side -	10 53						
				<i>England, East Coast.</i>			
<i>Orkneys.</i>				Holy Island Harb.	2 30	15	11½
Widewall (South }				North Sunderland	2 30	15	11½
Ronaldsha) - }	9 3	10	7½	Coquet Road -	3 0	14½	11
Stromness (Main- }				Blyth -	3 15	15	11
land) - }	9 0	10	7½	Tyne River (Bar)	3 20	14½	11½
Scapa -	9 5	10	7½	" North Shields }			
Deer Sd. (Main- }				(Low Lt. Hse.) }	3 23	13½	10
land) - }	10 30	10	7½	" Howden -		12	
Kirkwall -	10 9	10	7½	" Walker -		10½	
Westness (Rowsa)	9 11	10	7½	" Newcastle -	4 23	10½	
Otterswick (Sanda)	9 13	11	8	Sunderland -	3 22	14½	11
				Seaham -	3 24	14½	10½
<i>Shetland Isles.</i>				Hartlepool -	3 28	15	11½
Fair Isle -	11 0	5	3	Tees River, Bar -	3 45	15	12½
Sumburgh Head }				" Middlesbrough	3 55	13	10½
(Mainland) - }	9 45			" Stockton -	4 40	11	
Scalloway -	9 30	5½	4½	Whitby -	3 45	15	11½
Hillswick, or Urie }				Scarborough -	4 11	15½	12½
Firth (St. Mag- }				Filey Bay -	4 20	16	12½
nus Bay) - }	9 45	6½	5	Flamborough Head	4 30	16	12
Lerwick (Mainland)	10 30	6	4	Bridlington -	4 39	16	12
Balta (Unst) -	9 45	6	4½	Humber River, }			
				Spurn Point - }	5 26	18½	15
<i>Scotland, East Coast.</i>				" Grimsby -	5 36	19½	15
Duncansby Ness -	10 14	8½	6	" Killingholme	6 2	19½	15½
Wick -	11 22	10	7½	" Hull -	6 29	20½	16½
Loch Fleet -	0 22	10½		" Ferriby Sluice	6 41	20½	
Dornock Road -	11 47	11		" Blacktoft -	6 59	16	
Cromarty -	11 56	14	11	" Goole -	7 26	13	
Inverness (Kelloch }				Boston Deep, Clay }			
Pier) - }	12 18	12	9½	Hole - }		21½	
Banff -	0 28	10½	8	" Hob Hole -		17	
Fraserburgh -	0 40	11	8½	" (Sluice) -	7 0	12	
Peterhead -	0 34	10½	8½	Lynn Deep, Long }			
Ythan River -		9½		Sand - }	6 0	23	
Aberdeen -	1 0	12	10	" Lynn Road -		20	
Stonehaven -	1 10	14	11	" Lynn -		18	
Montrose -	1 25	13	10	Wisbeach Eye -		20	
Arbroath -	1 35	14	11	Sutton Bridge -		18	
				Wisbeach -	7 30	15	
				Wells Bar -	6 20	18	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wells - -	7 0	12		Gravesend - -	1 10	17½	14
Blakeney Bar -	6 30	15		Woolwich - -	1 37	18½	15½
Blakeney - -		9		Greenwich - -	1 43	19	15
Cley - -		5½		London Docks -	1 57	19½	17
Cromer - -	7 0	14½	11	London Bridge -	2 7	19½	16½
Leman Shoal -	6 0			<i>Ireland, South and East Coasts.</i>			
Ower Shoal - -	6 30			Cape Clear - -	4 0	9	6½
Hammond Knoll -	7 40			Baltimore - -	4 23	10½	8½
Winterton Ness -	8 25	7½	6½	Castletownsend -	4 21	10½	8
Yarmouth Road -	9 15	6	4½	Clonakilty Bay -	4 30	11	8½
" Haven, Brush		5½	4½	Courtmacsherry -	4 36	10½	8½
" Bridge - -		5	4	Kinsale - -	4 43	11½	9
Lowestoft - -	9 57	6½	5½	Queenstown - -	5 1	11½	9
Blyth River, South	10 20	6½	4½	Cork, (Penrose } Quay) - }	4 58	12½	10
wold - -				Ballycottin - -			
Aldborough - -	10 45	8?	6½?	Youghal - -	5 14	12½	10
Kentish Knock -	11 47			Ballinacourty, }	5 12	12½	9½
Orfordness - -	11 15	8	6½	Dungarvan - }			
Hollesley - -	11 30	8?	6?	Dunmore - -	5 27	12½	9½
Orford Haven Bar	11 30	7½		Waterford (Dun- }	5 20	12½	10
Orford Quay - -	12 36	7½		cannon Fort) - }			
" Slaughden -	1 0	7½		— (Bridge) - -	6 6	13½	10½
" Snape Bridge	3 0	6		New Ross - -	6 4	12½	10
Woodbridge or }	11 45	12	9	Saltees - -	5 40		
Bawdsey - }				Wexford - -	7 21	5	3½
Haven Bar - }				Kilmichael Point -	8 30	4½	3
" Kingston Quay	12 35	10		Arklow - -	8 45	4	3
" Wilford Bridge	12 55	7		Wicklow - -	10 29	9	6½
Harwich Harbour	12 6	11½	9½	Bray Head - -	10 45	12	9½
Orwell River, Pin- }	12 20	12		Dalkey Island -	10 45	13	11
mill - -				Kingstown - -	11 10	11	8½
" Downham - }	12 27	12		Dublin Bar (Pool- }	11 12	12 - 14	9 - 11
Reach - -				beg Lt. House) }			
" River, - }	12 35	13½		Howth Harbour -	11 9	13	10
Ipswich - -				Malahide Inlet -	11 15	10	8
Stour River, }	12 29	12		Rogerstown Inlet -	11 15	10½	8
Wrabness - }				Skerries Islands -	11 0	13	10
" Mistley Quay	12 48	11½		Balbriggan - -	10 40	11	
" Cattawade - }	1 8	4½		Drogheda (Bar) -	11 0	11½	9
Bridge - -				Dundalk - -	10 56	13½	11½
The Naze - -	12 6	12½	10	Greencastle Point	11 2	14	11½
Colne River, Colne }	12 0	14	10	Carlingford (Bar) or	11 0	14	11
Point - -				Cranfield Point.			
" Wivenhoe - -	12 10	15	10½	" Warrenpoint -	11 10	14½	12
Blackwater River, }	12 0	14½	10	Newcastle - -	11 4	14½	12
Scales Point - }				Ardglass - -	11 0	16	12
" Heybridge - -	12 20	12	8	South Rock - -	10 58	13	10½
Chelmer River, }	12 32	10	6	Lough Strangford }	10 53	14	11½
Maldou - -				(Killard Point) }			
Gunfleet Sand, N.E. }	11 40	12	8	" Strangford }	12 31	10½	8½
end - -				Quay - }			
Crouch River, }	12 5	14½	10½	" Quoile Quay	12 45	11	9½
Foulness - }				" Kircubbin	12 42	11½	9½
" Hull Bridge	12 25	16	11	" Killyleagh	12 40	11	9½
Maplin Light - -	12 5	14½	10½	Head of the Lough }	12 44	11½	9½
Margate - -	11 40	15½	13	(Turley Rocks) }			
Pansand Hole - -	2 0	15½	13				
Nore - -	12 30	15½	13				
Sheerness - -	0 37	16	13½				
Chatham - -	1 2	17½	14				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Iceland.				Africa, West Coast. (From Cape of Good Hope to the Northward.)			
Reikiavik - -	h. m. 5 0	ft. 17½	ft. 18½	Simons Bay -	h. m. 2 44	ft. 5½	ft. 3½
Lapland.				Hout Bay -	2 20	5	
Liza Bay - -	5 58	9		Table Bay -	2 40	5	
Nova Zembla Harb.	6 36	10		Saldanha Bay -	2 0	6	
Jekatarina Islands	6 23	10		St. Helena Bay -	2 30		
Kildin Island -	6 45	12		Roodewall Bay -	2 30	6½	
Habitable Island, }	7 9	9		Hondeklip Bay -	2 30	5½	
Seleney Bay - }				Mc. Dougall Harb.	2 30	5½	
Teriberka River -	7 20	12		Port Nolloth -	2 30	5½	
Olenji Islands -	7 30	12		Elizabeth Bay -		5 - 6	
Charlowka River -	8 8	12		Angra Pequena -	2 30	8	
Seven Islands -	8 20	12		Ichabo Island -	1 0	6	4
Jukan Islands -	9 0	13		Spencer Bay -	10 50	5 - 6	
Sviatoi Nos -	9 15	14		Port d' Ilheo -	3 0	8 - 10	
White Sea.				Walvisch Bay -	1 54	6	
Inkanskie - -	9 15	14		Port Alexander -	3 0	5	
Turna Bay -	9 54	11		Great Fish Bay -	2 30	5 - 6?	
Trek Island -	10 48	20		Little Fish Bay -	2 30		
Litke Bank -	11 45	15		Lobito Bay -	2 20	5	
Cape Kanushin -	11 54	15		Benguela -	2 30	5?	
Sosnovets -	11 44	18		St. Helena Island -	3 11	3	
Morjovets I. -	11 20	17		Ascension Island -	5 30	2	
Cape Voronov -	11 20	17		San Paul de Loanda	4 30	5	
Intsi Point -	11 55	16		River Congo -	4 30	6	
Kouloi River -	1 15	20		Loango Bay -		6½	
Mezen -	1 48	15 - 22		Mayumba -		7	
Kerets Point, Gulf }	4 30	5½		River Gaboon -	5 30	3	
of Arkhangel - }				Cape Lopez -	4 30	4 - 6?	
Nikolskoi Tower „	6 0	2		Corisco Bay }	5 0	7	
Moudiuga I. „	5 50	3½		(Elobey Isles) - }			
Dvina Bar -		3½		Anno Bom Id. -	3 45	5	
Arkhangel „	7 28	2½		St. Thomas Id. -	3 25	4½	
Nikolskoi Chan. „	5 25	3		Princes Id. -	3 45	4½	
Gribanika Pt. „	4 50	3		Fernando Po -	4 0	7	
Jijginsk I. -	5 15	4		Cameroon River -	4 0?	6	
Cape Orlov Letni, }	5 18	4		Bonny and New }	5 0	9	
Gulf of Onega - }				Calabar Rivers- }			
Onega River -	9 17	6 - 7		Brass River -	4 0	6	
Souma -	6 30	5½		River Niger, Nun }	4 8	6	
Solovet Road -	5 0	4		(entrance) - }			
Kyem River -	5 23	4		„ Middleton -	4 15	5	
Kalgalaksha -	6 50	7		„ Pennington -	4 15	5	
Keret, Gulf of }	3 8	6		„ Dodo -	4 17	5	
Kandalak - }				„ Ramos -	4 20	5	
Kovda Bay -	3 25	6		„ Forçados -	4 22	5	
Kandalaksha „	3 25	7		„ Benin -	4 30	7	
Sosnovaia Bay „	2 40	6		„ Lagos (Bar) -	6 0	3	
Kou Zomen -	3 30	6		„ „ Consulate }		2	
Tetrina -	3 17	7		Wharf }			
Nova Zembla.				„ Palaver Ids. -		1	
Hakluyt Head -	1 30	4		Cape Coast Castle -	4 30	6	
Spitzbergen.				St. George d'Elmina	4 30	6	
Bell Sound -	8 56	3½		Cape Three Points-	4 0	4	
Danes Id., South }	0 24	5½		Axim -	4 30	4	
Gat - }				Grand Lahou -	4 20	4	
				Tabou River -	4 45	3 - 4	
				Cape Palmas -	4 30	4	
				Sinou -	5 0	4	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sangwin River -	5 15	4		Tunis (Goletta) -		3	
Grand Cestos -	5 20	4		Sphax Roads -	4 30	5	3
Edina -	5 50	4		Jerba -	3 10	7	5
Junk River -	5 45	5		Malaga -	12 0	3	
Monrovia -	6 0	6		Yafa (Syria) -	10 0	1½	
Gallinas River -	6 45	4		Tripoli -	10 20	2	
Gilmorris Id. } Sherbro River- }	6 0	11		Lissa (Adriatic) -	4 10	2½	
Edmonstone Id. „		8		Trieste „ -	9 35	3½	
Bagroo River „		11		<i>Europe, West Coast.</i>			
Banana Islands -	8 15	9		Gibraltar, old Mole	2 20	3½	
Sierra Leone -	7 55	8		Algeçiras -	1 49	4	2½
Yellaboi Island -	7 10	10		Tarifa -	1 46	6	3½
Scarcies Rivers -	7 10	10		Cadiz -	1 45	9½	
Mellacoree R. -	7 40	11		Rota -	1 24	12½	8
Forecarreah R. -	7 40	11		Salmedina Rocks -	1 27	12½	8
Mahneah R. -	7 40	11		Chipiona -	1 34	12½	8
Isles de Los -	6 35	13		San Lucar -	1 53	12½	8
River Ponga -	7 30	12	9½	Bonanza -	2 0	12½	8
„ Nunes -	10 0	15	11½	Conil -	1 18	11½	7½
„ Componee -	10 0	15	11½	Lagos -	2 7	13	
Bijouga Ids., Or- } ango Channel - }	10 0	11		Setubal -	2 30	8	
„ Arcas } Channel - }	10 10	11 - 14	9	Lisbon (Belem) -	2 30	12	9
„ Bissao- }	11 0	8		Peniche -	1 54		
River Cacheo -	7 45	8		Mondego (Bar) -	2 30	7	
„ Gambia -	8 10	6 - 9		Oporto -	2 30	10	
Joombas River -	8 10	6		Fayal, Azores -	11 45	4	
Salm River -	8 10	6		Terceira „ -	12 32	4½	
Goree -	7 45	2½		St. Michael „ -	12 30	6	
Senegal (Bar) -	8 42	6		Funchal Bay, Ma- } deira - }	12 48	7	
„ (Guet } N'dar) - }	8 42	6		Vigo -	3 0	12 - 13	
„ (St. Louis)	10 0	6		Cape Finisterre -	3 0		
Sal, C. Verde Ids.	7 45	5		Port Camariñas -	3 0	15	
Porto Praya „ -	6 0?	5		Corunna -	3 0	15	
Portendik -	10 0	6		Ferrol -	3 0	15	
Levrier Bay -	12 0	6 - 7		Cedeira -	3 0	15	
Ouro River -	12 0	8 - 9		Vivero -	3 0	15	
Cape Blanco -	11 46	6		Rivadeo -	3 0	15	
Cape Bojador -	12 0	8?		Barquero (entrance)	3 0	15	
Cape Juby -		8		Gijon Bay -	3 0	14	11
Ferro, Canary Ids.	12 30?	9?		St. Martin de la } Arena - }	3 30	15	
Palma „ -	12 30?	9?		Santander -	3 30	15	12
Gomera „ -	12 45?	9?		Santona -	3 30	12½	10½
Lanzarote „ -	1 0?	9?		Bilbao (Bar) -	3 0	13	
SantaCruz, Tenerife	1 30	8	6	Olaveaga -	3 15	12	
Puerto de la Luz, } Gran Canaria - }	12 52	10		Bilbao (Town) -	3 20	9	
Santa Cruz or } Agadir - }	12 45	9		St. Sebastian -	3 0	12	9
Mogador -	1 18	10 - 12		Port Pasages -	3 0	12	9
Cape Cantin -	10 0	10		Socoa -	3 19	12½	8
Rabat -	1 46	9 - 12		Bayonne (Bar) -	3 45	12	10½
El Araish -	1 30	9 - 12		Boucant, Adour R.	3 39	8½	6
Tangier -	1 42	8		Arcachon -	4 37	11½	9½
<i>Mediterranean.</i>				Cordouan Lt. house	3 37	13½	10½
Centa -	2 6	3½	2½	Royan -	3 38	13½	10
Tetnan -	2 23	2½	1½	St. Surin -	4 11	14½	11
				Bordeaux -	6 50	14	12½
				Iled'Aix, Charente } R. Entrance - }	3 20	17	12½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Ile d'Oleron -	3 50	19		Port Edgar -	7 15	6	
Rochefort -	4 6	17	13	Fox Bay -	7 0	6	
Rochelle -	3 31	17	13	Manybranch Harb. -	7 40	7½	
Les Sables d'Olonne -	3 26	14	10	Port Egmont -	7 30	11	
Seudre River (en- } trance, - }	3 31	15	11½	Hope Harbour -	8 10	7	
Ile d'Yeu -	3 6	14½	10	Shallow Harbour -	9 30	6	
Ile de Noirmoutier -	3 2	16	11½	Ship Harbour, New } Island - }	10 30		
Port Navallo -	3 42	13	9½	<i>South America, East Coast—continued.</i>			
St. Nazaire -	3 10	15½	11	Port Gallegos -	8 50	46	
Port le Palais, } Belle Ile - }	3 18	14½	10½	Coy Inlet -	9 30	40	
Port Louis, L'Orient -	3 11	13	9½	Santa Cruz River -	9 30	40	29
Concarneau -	3 12	13	9½	Port San Julian -	10 45	30	
Penmark Rocks -	3 16			„ Desire -	12 10	18½	
Glenan Is. -	3 12	13	10	„ Melo -	3 40	15	
Ile de Sein -	3 21	17½	12	„ Santa Elena -	4 0	17	
Brest -	3 47	19	13½	Nuevo Gulf -	7 0	10	
Conquet Road -	3 46	21	15	Port San Josef -	10 0	30	25
Ushant -	3 32	19½	13½	Sea Bear Bay -	12 45	20	
<i>South America, East Coast.</i> <i>(Cape Horn to the Northward.)</i>				Port San Antonio -	10 45	18-30	
St. Martin Cove, } Cape Horn Ids. }	3 50	8		Rio Negro -	11 0	14	10
Cockburn Island } (Antartic Ocn.) }	7 50	6		San Blas (Rubia } Head) - }	1 30	12	10
Cape Peñas -	6 42	12		Colorado River -	4 0	9	7½
Cape San Diego -	4 30	10		Union Bay -	3 10	12	9
Orange Bay -	3 30	6		Port Belgrano -	6 0	12	10
Goree Road -	4 0	8		Tristan da Cunha -		8	
Le Maire Strait -	4 0	7		*Riodela Plata, (C. } Castillos) }	8 30	2	
Staten Island -	4 30	8		„ Buenos Ayres	12 0	3-8	
San Sebastian Bay	7 0			„ Barragan Bay	7 0	5-9	
<i>Falkland Islands, East Falkland.</i>				Rio Grande do Sul		1½-2	
Berkeley Sound -	5 0	7		Santa Catharina I.	2 45	6	4½
Port William -	5 15	7	5½	San Sebastian -	2 0	4	
Port FitzRoy -	4 45	6		Ilha Grande (Es- } trella Bay) - }	12 30	5	4
Port Pleasant -	5 0	6½		Rio Janeiro -	3 0	4	3
Island Harbour, } Choiseul Sound }	5 20	6		Porto Frio -	2 40	4½	
Mare Harbour -	6 0	6		Macahé -	2 36	9½	
Darwin Harbour -	6 30	5½		Benevente -	3 0	5	
Walker Creek -	6 20	5½		Espirito Santa } Bay, and Port }	3 0	4	
Low Bay -	5 0	5½		Victoria -			
Adventure Sound	5 30	5½		Abrolhos -	3 20	6-7	
Bull Road, Bay } of Harbours - }	6 0	5		Martin Vas Rocks	3 45		
Falkland Sound N. } entrance }	6 45			Os Ilheos -	4 30		
„ S. entrance	7 0			Bahia -	4 15	8	
Ruggles Bay -	7 30	5		Maceio -	4 30	8½	
Port King -	7 30	5		Pernambuco -	4 45	8	6
„ Sussex -	8 15	6		Parahiba -	5 0	9-12	
„ San Salvador	8 10	8		Cape St. Roque -		8-10	
„ San Carlos -	7 0	8		Rocas -	5 15	10	
<i>West Falkland.</i>				Fernando Noronha	4 0	6	
Port Stephens -	7 45	7½		Aracati -	6 0	8	6
„ Albemarle -	7 15	7		Ceara -	4 30	9	
				Jericoacoara -	11 30	12	9
				Maranhã -	7 0	16½	10½
				San Joao -	6 24	14	
				Para -	12 0	11	10½

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cayenne River -	3 45	6-11		Hanover Sound -	8 15	4	3
Maroni River -	5 30	8		Douglas Road -	8 30	4	2½
Surinam -	6 0	5½		Abaco -	8 0	3	
Corentyn River -	5 10	8½	6	Man-of-War Cay -	8 10	4	
Berbice -	4 30	11½	6½	Gun Cay -	8 30	3	
Demerara River -	4 45	9	6	Memory Rock -	7 50	3	
Orinoco R. (entr.)	6 0	3		Bluff Cay -	7 0	4½	
Chacachacare Id., } Trinidad }	3 30	4		Puerto de la Plata, }	7 30	3½	
Dragons Mouths } (Boca Grande) „ }	3 30	4	2½	St. Domingo - }	7 0	4-5½	
„ Boca Monos „	3 50	4	2½	Mancenille Bay -	7 0	5½	3½
Chaguarama Bay „	4 20	4	2½	Fort Dauphin -	7 0	5½	
Port of Spain „	4 30	4	2½	Cape Haiti, St. }	6 0	3	
San Fernando „	4 38	5	3	Domingo - }	6 0?	3½	
Icacos Point „	4 14	7	4	Lacul Harb. „	8 0?	1½	
Tobago -	3 0	4	2	Gonaives Bay „	8 0?	1½	
Cartagena -	11 0	1½	1	Bay of St. Mark „	8 0?	1½	
Caledonia Harbour	11 40	1½	1	Port au Prince „	8 0?	1½	
<i>Caribbean Sea and the Bahamas.</i>				Caimites „	8 0?	1½	
St. Vincent } (Kingstown) - }	3 0	1½	1	Bay of Aux Cayes „	uncertain	2-3½	
Grenada, (St. } George Harb.) }	2 40	1½	¾	Flamand Bay „	„	2-3½	
Grenadines -	3 0	1½	1	St. Louis Bay „	„	2-3½	
Barbados -	irr.	2		Aquin Bay „	„	2-3½	
Martinique(Robert } Harbour) - }		4-5		Jacmel „	„	2-3½	
English Harbour, } Antigua - }		2		Havana, Cuba* -	8 14	3	
Anegada -	9 0	1½		Boca de Varadero „*	8 39	2	
Gorda Sound, } Virgin Island - }	8 30	1½		Baracoa „*	7 23	2½	
Tortola -	8 30	1½		Puerto de Mata „*	6 49	2½	
Culebra or Pass- } age Island - }	9 0	1		Santiago de Cuba „*	8 33	2½	
Christiansted, } Santa Cruz - }	7 30	¾		Playa de Incia „*	7 31	2½	
San Juan, Porto } Rico - }	8 2	1½		Puerto de Baiti- } queri „* - }	9 7	2½	
Saintes -	6 45			Puerto de Maravi „*	7 56	2½	
Inagua -	8 0	3½	2½	Puerto de Taco „*	8 49	2½	
Mira-por-vos -	9 30	3	2½	Cape St. Antonio „		1½	
Turks Islands -		3		Port Royal, Jamaica	11 0	1	
Stirrup Cays -	7 0	4		<i>Bermudas.</i>			
Crooked Island -	7 0	2½		Ireland Id. Dock }	7 14	4	
Exuma -	7 20	2½		Yard - }			
Royal Island -	7 45	3½		<i>North America, East Coast. (Isthmus of Pa nama to the Northward.)</i>			
ClarenceHarbour, } Long Island - }	8 30	4	3½	Greytown -	9 0	1½	
Rugged Island -	8 0	3		Blewfields -	1 50	2	
Mucaras Reef -	7 40	3		Corn Islands -	1 45	2	
Lobos Cay -	7 40	3		Colombilla Cay, }	2 0	2	
Guinchos Kay -	7 40	3		Pearl Cays - }			
Nassau, New Pro- } vidence - }	7 30	4	3	Cape Gracias Harb.	10 30	2	
S. W. Bay „ -	7 30	4		Royal Harbour, }	7 45	3½	
Salt Cay Anchorage	8 15	4	3	Ruatan - }			
				Serranilla Bank -	irr.	2	
				Serrana Bank -		2	
				Old Providence -	irr.	1	
				Bonacca Island -	9 0	1½	
				Mugeres Harbour	9 30	1½	
				Cozumel -	8 30	1½	
				Cape Catoche -	9 30	1½	
				Campeche -	1 45	2½	2
				Sisal -		2	

* From the Anuario de la Direccion de Hidrografia, Madrid, 1863.

Place.	High Water Full and Change.	Rise.		Place.	High Water Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Laguna de Terminos	noon	1½		Cape Fear River } (Smithville)* - }	7 19	5½	4½
Triangles - -		1½		Bald Head* - -	7 26	5	4½
Arcas Rocks - -	noon	1½		Port Royal Sound*:			
Vera Cruz - -		2		Entrance -	7 16	7½	6½
<i>United States.</i>				Beaufort -	7 26	3½	2½
<i>(Texas, Louisiana, Mississippi, Florida, Georgia, and S. & N. Carolina.)</i>				Ocracoke Inlet* -	7 4	2½	2
				Hatteras Inlet* -	7 4	2½	2
Brazos R. (entr.)*	irr.	1½		<i>(Chesapeake Bay and Rivers.)</i>			
St. Luis Pass, Texas*		1½	¾	Cape Henry -	7 40	4	
Galveston - -		1½	¾	Cape Charles -	7 45	5	
Sabine Pass* -		1½		Old Point Comfort*	8 17	3	2½
Calcasieu River* -		2½	1½	James R., City Point*	2 11	3	2½
Vermilion Bay } (entrance)* - }	irr.	2½	1½	Richmond* - -	4 28	3½	2½
Atchafalaya Bay* -	irr.	2 - 2½		York R. (Moody's Wharf) - - }	9 35	3½	
Timballier Bay* -	irr.	2		Piawkatank River } (Cherry Point) - }	10 5	2	¾
Barataria Bay } (entrance)* - }	irr.	1½		Tappahannock* -	0 42	2	1½
Mississippi S.W. pass		1½	¾	Rappahannock } (Saunders Wharf) }	3 2	2½	2
Biloxi* - -	irr.	2		Point Lookout* -	12 58	2	1½
Mobile - -	irr.	1 - 2		Patuxent River* -	1 16	2	1½
Pensacola - -		1½		Annapolis* - -	4 38	1	1
St. Andrews Bay*	irr.	1 - 2		Chester R. (Rock-hall Creek)* - }	5 23	2½	1
St. Georges Sound } (west entrance)* }	irr.	2½ - 4		Patapsco River } (Bodkin Point)* }	5 42	1½	1
(middle entr.)* }	1 31	1½	1½	Baltimore* -	6 33	1½	1½
Apalachicola Bay -		2½ - 4		<i>(Delaware Bay and River.)</i>			
St. Marks* - -	1 14	3	2½	Cape Henlopen -	8 0	4½	
Cedar Cays* - -	0 51	3½	2½	Delaware Break-water* - - }	8 0	4½	3½
Tampa Bay* - -	11 21	1½	1½	Higbees, Cape May*	8 33	6½	5½
Tortugas* - -	9 56	1½	1	Egg Island Light*	9 4	7	5½
Cay West* - -	9 30	1½	1½	Mahons River* -	9 52	7	5½
Cay West, N.W. } Channel* - }	9 10	1½	1½	New Castle* -	11 53	7	6½
Sand Cay* - -	8 40	2	1	Philadelphia* -	1 18	6½	5½
Indian Cay* - -	8 23	2½	1½	<i>(New Jersey.)</i>			
Cape Florida* -	8 36	1½	1½	Cape May Landing*	8 19	6	5
Lower Matacumbe Bay* - }	8 23	2½	1½	Cold Spring Inlet*	7 32	5½	4½
St. Augustine* -	8 21	5	4	Little Egg Harbour	7 10	4½	3½
St. Johns River* -	7 28	5½	5	<i>(Long Island Sound.)</i>			
Fort Clinch, Fernandina* - }	7 53	6½	6½	Watch Hill* -	9 0	3	2½
St. Simons Island*	7 43	8½	6½	Stonington* - -	9 7	3½	3
Doboy Lighthouse*	7 33	7½	7	Little Gull Island*	9 38	3	2½
Savannah (City)* -	8 13	7½	6½	New London* -	9 28	3	2½
Fort Pulaski, Savannah (entr.)* }	7 20	8	7	New Haven* -	11 16	6½	5½
Hilton Head* -	7 19	7½	6½	Bridgeport* -	11 11	8	6½
St. Helena Sound*	7 8	7½	6	Sheffield Island*	10 58	8½	7½
North Edisto R.* -	7 10	7	5½	Oyster Bay*	11 7	9½	8
Charleston* - -	7 26	6	5	Sands Point*	11 13	9	7½
Bulls Island Bay -	7 16	5½	4½	New Rochelle*	11 22	8½	7½
Georgetown* - -	8 40	4½	3½	Throgs Point* -	11 20	9½	7½
South Island* - - }	7 56	4½	3½				
Wilmington* - -	9 6	3	2½				

* From the United States Coast Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
(New York to Portland.)				Bay of Fundy, Nova Scotia.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tarrytown* -	9 57	4	3½	Cape Sable, Bar-	8 27	8½	6½
New York* -	8 13	5½	4½	ington Bay, }			
Sandy Hook* -	7 29	5½	5	(Clam Point) -			
Hell Gate Ap-				CapeSable,Clarkes	8 58	11	9
proaches* :				Harbour - }			
— Long Island }	9 59	6	5½	Pubnico - -	9 25	12	10
(Blackwells Dk.)* }							Argyle, (Jones }
— — N. of Asto-	9 48	6½	5½	Anchorage) - }	9 27	12¾	10½
ria Ferry* - }							Seal I. (Cape Sable)	9 49	12¾	10½
— — Pot Cove, }	10 48	8½	6½	Ellenwoods An-	9 54	13	10½
(S.E. part)* - }				chorage - }			
— Wards Island }	10 9	6½	5	Jebogue - -	10 4	15	11¾
(Paupers Dock)* }				Yarmouth - -	10 9	16	13
Montauk Point* -	8 20	2½	2	East Sandy Cove, }	10 33	21½	17¾
Block Island* -	7 36	3½	2½	St. Mary Bay - }			
Point Judith* -	7 32	3½	3½	Petit Passage -	10 41	22	18
Newport* -	7 45	4½	4	Grand Passage -	10 43	20¾	17
New Bedford, entr.*	7 57	4½	4	WestSandy Cove, }	10 47	23	19
Bird Island Light*	7 59	5½	4½	St. Mary Bay - }			
Kettle Cove* -	7 48	5	4½	Digby Gut -	11 0	27½	23
Cattyhunk* -	7 40	4½	3½	Port George -	11 17	32	28
Quicks Hole }	7 36	3½	3	Isle Haute -	11 21	33	28½
(S. Side)* }				Black Rock -	11 29	36	31
„ (N. Side)* }	7 31	4½	3½	SpensersAnchorage	11 42	39	33
Menemsha Bight*	7 45	4	2½	Parsboro, Basin }	12 17	43	37½
Woods Hole (entr.				of Mines }			
from Vineyard }	8 34	2	1½	Horton Bluff „ -	12 30	48	40
Sound)* - }				Noel Bay „ -	12 41	50½	43½
— (entrance from				Bay of Fundy, New Brunswick.			
Buzzard Bay)* }	7 59	4½	4	Machias, Seal Isd.	11 5	18	14¾
Taraulin Cove* -	8 4	2½	2½	Seal Cove, Grand }	10 54	20	15
Gay Head -	7 37	7		Manan - }			
Holmes Hole* -	11 43	1½	1½	Grand Harbour, }	11 7	21	17½
Edgartown* -	12 16	2½	2	Grand Manan - }			
Hyannis* -	12 22	4	3	Fish Head, Grand }	11 16	22½	18½
Nantucket* -	12 24	3½	3	Manan - }			
St. George Shoals	10 30	7		West Quoddy -	11 12	21	17
Monomoy* -	11 58	5½	4	Campobello }	11 21	23½	20
Provincetown* -	11 22	10½	9½	(Welchpool) - }			
Wellfleet* -	11 5	13½	12	St. Andrews -	10 50	25	21
Cape Cod -	11 30	13		L'Etang Harbour -	11 19	23½	20
Barnstable -	11 22	10	8½	Lepreau -	11 18	24½	21
Plymouth* -	11 19	11½	10½	St. John Harbour	11 21	27	23
Boston Light* -	11 12	11	9½	Quaco -	11 35	30	25
Boston (Charles-	11 27	11½	10	SpicersCove (near }	11 35	37	30½
town NavalYd.)* }				Cape Chignecto) }			
Salem* -	11 13	10½	9	Grindstone Island-	11 47	41	34½
GloucesterHarbour*	11 4	10½	8½	Folly Point }	11 49	45	38
Rockport* -	10 57	10½	8	(mouth of Petit-			
Annisquam* -	11 0	10½	9	coudiac River - }	11 55	45½	38
Ipswich* -	11 26	10½	8½	CumberlandBasin, }			
Newburyport* -	11 22	9	7½	(Sackville - }	12 15	47	37½
Portsmouth* -	11 23	10	8½	Monckton(Railway)			
Richmond Island*	11 30	10½	9	Nova Scotia.			
Portland* -	11 25	10	7½	Negro Harbour -	8 12	7	5½
Kennebec River }	11 15	9½	7	Shelburne -	8 4	7	5½
(Hanniwells							
Point)* - }							
Mount Desert Id. -	11 10	13	.				

* From the United States Coast Survey, the time of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rugged Island -	7 59	7½	6	Hillsborough River:			
Port Mouton -	7 54	7½	5½	Charlottetown -	10 45	9½	8
Liverpool Bay -	7 50	8	5	Head of River -	11 0	10	7
Port Metway -	7 50	8	5	Crapaud -	10 0	8	6
Cape le Have } (Spectacle Id.)	7 48	7	5½	Bedeque Harbour -	10 15	7	5
Le Have, Crooked } Channel	7 51	7½	6	Minimegash -	3 30	5	3
„ Mothers Island	7 51	7	5½	Egmont Bay -	3 0	4	2
„ Getsons Cove	7 55	7½	6	Cascumpeque Hr. -	5 40	3	2
„ Bridgewater, } McKean's Wharf	8 6	8	6½	Richmond Harb. -	6 0	3	2
„ Lunenburg } (Spidlers Cove)	7 54	7½	6	Cape Turner -	6 10	4	2
Little Tancock Id.	7 43	7½	6	Grand Rustico -	6 40	4	2
Mahone Bay, } Heckmans Anchorage	7 45	7½	6	Tracadie -	7 0	3½	2
„ Princes Inlet	7 42	7½	6	St. Peter Harbour	8 30	4	2½
„ Ham Island	7 47	7½	6	Boughton Harb. -	8 40	5	2½
„ Martin's River	7 43	7½	6½				
„ Chester -	7 44	7	5½				
Prospect River -	7 43	7	6				
Blind Bay -	7 46	7½	6				
St. Margarets } Bay, Shut-in Id. }	7 47	7½	6				
Sable Island, N. side	7 30	4					
„ S. side	6 30	4					
Halifax Harbour -	7 49	6	5				
Jedore Harbour -	7 45	6½	4½				
Ship Harbour -	7 54	6½	4½				
Sheet Harbour -	8 6	6½	4½				
Liscomb Harbour -	8 0	6½	4½				
Beaver Harbour -	7 40	6½	4½				
Island Harbour, } Country Harb. }	7 40	6½	5½				
Whitehaven -	8 0	6½	4½				
Canso Harbour -	7 48	6½	4½				
Crow Harbour -	8 0	6½	4½				
Guysborough -	8 20	6½	4½				
Pomquet -	9 15	4	2½				
Cape George -	9 15	4	2				
Merigomish -	10 6	5½	3½				
Pictou Harbour -	10 0	6	4				
Caribou Harbour -	10 0	6	4				
Amet Sound -	10 30	8	5				
Tatamagouche -	10 0	8	5				
Wallace Harbour -	10 30	8	5				
Pugwash Harbour	10 30	7	4				
Bay Verte -	10 0	9	5				
<i>New Brunswick.</i>							
Jourimain Island -	9 30	6	3				
Shediac Harbour -	{ 1 0 } 8 0	4	2				
<i>Prince Edward Island.</i>							
East Point -	8 30	3½	2				
Cardigan Bay -	8 40	5	3½				
Cape Bear -	9 0	6	3				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bay of Seven Islands -	1 40	9	5	Beaubère Island -	6 30	6	4
Anticosti Island (East Cape) -	1 0	5	3	Point Escuménac -	4 10	4	2½
Bear Bay -	1 10	5	3	Richibucto River -	3 30	4	2½
West Point -	2 0	6	4	Buctouche River -	7 0?	4?	2?
Avée Islands -	1 50	9	5	Cocagne River -	7 30?	4?	2?
Ag Island -	2 0	11	6	<i>Newfoundland.</i>			
Mont de Monts -	12 0	12	6	St. Pierre -	8 33	6½	4½
Cape Chatte -	12 0	13	8	Lamalin Harbour -	9 15	8½	
Godbout River -	1 52	11	6	Great and Little Laun -	8 15	7	4
Nicholas Harb. -	1 55	12	7	Great St. Lawrence Harbour -	8 30	7	4
Manicougon River -	2 15	12	7	Burin Harbour -	8 45	6½	4½
Trimie River -	2 0	12	7	St. Mary Harbour -	7 40	7½	5
St. Island -	2 15	14	8½	North Harbour -	8 0	7½	5
St. Neuf -	2 10	13	8	Cape St. Mary -	8 30	7	5
St. Jean River -	2 15	11	7	Placentia -	8 30	7	5
St. Metis -	2 10	13	8	Trepassey Harbour -	7 0	6½	5
St. Jean, Tadoussac -	2 45	17	10	Cape Race -	7 0	6½	5
St. Chicoutimi -	4 11	12	8	St. Johns -	7 30	6	4
<i>River St. Lawrence.</i>				Harbour Grace -	7 30?	7?	
St. Jean River -	11 0			Bull Id., Trinity Bay -	7 22	3½	2
St. Louis Bay -	11 0	6-8	4	Hearts Content -	7 30	4	2½
St. Jean Island -	2 45	16	9½	New Perlican Harbour -	7 30	4	2½
St. Jean Pote -	3 0	17	10	Trinity Harbour -	7 10	3½	2
St. Jean Island (Prairie Bay) -	4 25	17	10	Deer Harbour -	7 49	3½	2
St. Jean -	5 0	17	10	Jones Harbour -	7 49	3½	2
St. Jean Island, Middle Traverse -	5 24	17	13	Catalina Harbour -	7 0	6	4
St. Jean Island, North Traverse -	5 40	17	13	Barrow Harbour -	7 10	5-6	
St. Jean -	6 38	18	13	Fogo Island -	7 20	4	
St. Jean River -	7 15	16	11	Funk Island -	7 0?	2-3?	
St. Jean Island -	8 0	14	9	Triton Harbour -	7 0?	2-4?	
St. Jean -	8 30	14	9	Cutwell Harbour -	7 0?	2-4?	
St. Jean -	9 0	9	6	Fleur de Lis Harb. -	7 15	2-4	
St. Jean -	9 30	6	4	Rouge Harbour -	7 0?	2-4?	
St. Jean -	9 45	3	2	Croc Harbour -	6 30	4½	
St. Jean -	9 48	3½	2	St. Julien Harbour {	7 21 A.M. 6 30 P.M.	4½	3
St. Jean Harb. -	9 0	4	2	Goose Cove -	7 0?	2-3?	
St. Jean Rivers -	11 30	1		Braha Harbour -	7 0?	2-3?	
<i>Gulf St. Lawrence.</i>				Lunaire Bay -	7 0?	2-3?	
Paul Id. -	8 0	5	3	Griguet Bays -	7 0?	2-3?	
St. Jean Islands -	8 20	3	2	Sacred B., (N. Cst.) -	7 23	2½	
St. Jean Basin -	2 40	5	3	Cook Harb. (N. Cst.) -	7 25	3?	
St. Jean Macquereau Point -	2 0	5	3	Good Bay -	10 40	7½	5½
St. Jean Point -	3 0	6	4	St. John Harbour -	10 40	7½	5½
St. Jean Harb. -	3 10	9		Castors Harbour -	10 50	5?	
St. Jean Town, and St. Margarets Bay -	4 0	10	7	New Ferole Cove -	9 28	4½ - 6½	
St. Jean -	3 15	7	4	Old Ferole Harb. and Brig Bay -	9 46	5?	
St. Jean -	3 42	5½	3	Port-au-Choix, (N. W. Coast) -	10 47	5	
St. Jean Harbour -	2 40	6	3	Cow Head Harb. -	10 41	8½	6½
St. Jean -	2 30	5	3	Petit Port, Bay of Islands -	10 42	5½	
St. Jean Bar -	5 30	5	3				
St. Jean Island -	6 0	5	3				
St. Jean Harbour -	5 45	5	3				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
St. George Harb., } W. Coast }	10 3	6 $\frac{3}{4}$	4 $\frac{1}{4}$	St. John River -	4 0	5	
York Harb. "	10 37	5 $\frac{1}{2}$?		Port Natal -	4 30	6	
Little Port "	10 42	5 $\frac{1}{2}$		Delagoa Bay, Eng- } lish River (Por- } tuguese Factory) }	5 20	12	
Codroy Island -	9 15	6	4	" (Port Melville)	4 30	15	
Port Basque -	8 55	5 $\frac{1}{4}$	3 $\frac{1}{4}$	" Shefeen Island	4 40	12	
La Poile Bay -	9 0	6	4				
<i>Hudson Strait.</i>				<i>Africa, East Coast.</i>			
Button Islands -	6 50			Inhambane River -	4 15	10	
Fury and Hecla } Strait, Melville }	7 0	8		Cape Bazaruto -	4 15	10	
Peninsula -				Sofala River -	4 0	19	
<i>Hudson Bay.</i>				Quilimane River } (entrance) - }	4 15	16	
York Factory -	11 15	10-14		Zambezi River } (Pearl Island) }	4 30	12-15	
<i>Arctic Regions, Greenland, West Coast.</i>				Luabo River (entr.)		22	
Julianshaab -	5 6	7	5	Angoxa River -		13	
Frederickshaab -	6 3	12 $\frac{1}{2}$	9 $\frac{1}{4}$	Antonio River -	3 15	13	10
Holsteinborg -	6 30	10		Mozambique Har- } bour - }	4 15	12	
Upernivik -	11 0	8		Pomba Bay -	4 0	15	11
Wolstenholm } Sound - }	11 8	7 $\frac{1}{2}$		Oibo Harbour -	4 15	6	
<i>Barrow Strait.</i>				Mahato Island -	4 30	7	
Port Leopold -	12 6	6	4 $\frac{1}{2}$	Cape Delgado -	4 0	16	11 $\frac{1}{2}$
Erebus Bay -	12 6	8		Rovuma River -	4 0	16	11 $\frac{1}{2}$
Griffith Island -	12 15	3 $\frac{3}{4}$	2 $\frac{3}{4}$	Pimlea Harbour -	4 30	12	
<i>Melville Island.</i>				Mungullo or } Mongallo River }	4 45	12	
Winter Harbour -	1 30			Lindy River (en- } trance) - }	4 15	12	
Dealy Id., Brid- } port Inlet - }	1 48	4		Kiswara Harbour -	4 30	12	
<i>Baring Island.</i>				Quiloea -	4 45	12	
Bay of Mercy -		2		Latham Island -	4 0	10	
Prince of Wales } Strait - }		3		Zanzibar (Channel)	4 15	11	
<i>Africa, South Coast.</i>				Zanzibar -	4 20	10	
Simons Bay -	2 44	5 $\frac{1}{4}$	3 $\frac{3}{4}$	Pemba Channel -	4 0	11	
Dyer Island -	2 50	5		Port Cockburn, } Pemba Id. - }	4 15	12	
Cape Agulhas -	2 50	5		Melinda -	4 0	11	
St. Sebastian Bay } (Port Beaufort) }	3 8	6		Mombaza -	4 15	11	
Mossel Bay -	3 30	6		Lamo Harbour -	4 6	11	
Knysna Harbour -	3 30	6 $\frac{1}{4}$		Patta Bay -	4 30	10	
Plettenberg Bay -	3 10	6		Port Durnford -	4 45	12	
Cape St. Francis -	3 34	5		Brava -	4 30	8	
Algoa Bay -	3 5	6 $\frac{1}{4}$		Marka or Muerka -	4 30	8	
Bird Islands -	4 0	4-5		Magadoxa -	4 30	8	
Kowie River -	4 0	4-5		Warsheek Roads -	4 30	8	
Waterloo Bay -	4 0	6		Rás Hafún or Ha- } foon - }	6 15	4	
Buffalo River (en- } trance) - }	3 45	4 $\frac{1}{4}$		Cape Guardafui or } Ras Jerdaffoon }	6 15	6	
				Bander Alúleh -	6 45	6	
				Bander Gorí -	8 45		
				Berberah or } Burburra (Gulf } of Aden) - }	7 15	9	
				Zeyla (Gulf of Aden)	7 15	8 $\frac{1}{4}$	
				Ghubbet Ne. Socotra	7 0	7	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Ghubbet Gollonsir	7 20	8		Aden & adjacent } Bays* - - }	7 30 to 9 30	7	4½
Bander Sháab -	7 0	7		Sughrá - -	8 0	6	
Abd-al-Kuri -	8 30	6		Makátein -	9 0	6	
Kal Farun -	8 20	6		Rás-al-'Asidah -	8 30	5½	
<i>Madagascar, East Coast.</i>				Makalleh -	8 30	7	
British Sound -	4 0	9½		Rás Sharmah -	9 0	8	
Port Leven -	3 30	7½		Merbát -	9 0	6¾	
Andrava Bay -	3 30	7		Kuriyán Muriyán } Bay & Islands }	8 20	6½	
Antongil Bay } (Port Choiseul) }	4 0	5		Cape Isolette -	9 0	10	
Tangtang Harbour	4 30	6		Sháb Kadún -	9 20	10	
Madame Island, St. }	4 0	5		Jezírat Hamar-al- }	9 30	10	
Mary Harbour }				nafur -			
Tamatave -	4 18	8		Sháb-'bu-saifeh -	9 45	10	
Fénérine -		3½		Ghubbet Hashísh -	10 0	10	
Fort Dauphin -	4 30	7		'Om-rasas-Masírah	10 0	10	
<i>Madagascar, West Coast.</i>				Rás Shébali -	10 0	10	
St. Augustine Bay	4 30	13		Rás-al-Hed -	9 30	9	
Noes or Sandy Id.	5 0	15		Khór Jerameh -	9 30	10	
Cape St. Vincent -	4 45	12		<i>Persian Gulf.†</i>			
Mourondava -	4 45	12		Maskat - -	11 15	6	
Barren Islands -	4 45	12		Jezírat Jún -	11 30	10	
Boteler River -	4 30?	15?		Rás al Kheī meh -	11 45	7	
Boyanna Bay -	4 30	15		Al Bida' - -	8 30?	6?	
Makumba River -	4 45	17		Bahreīn - -	5 30	7	
Bembatooka Bay -	4 30	16		Jezírat Arabī -	6 30?		
Majambo Bay -	4 30	16		Jezírat Kabr -		8½	
Narrinda Bay -	4 30	15		Koweyt - -	0 15	9	
Port Mazambo -	4 30	15		Basrah (Bar) -	12 0		
Port Radama -	4 40	13		Jezírat Kharg or }			
Pasandava Bay -	5 0	15		Kháreg - - }	8 0	6½	
Dalrymple Bay -	5 0	15		Abú-shehr - -	7 30	7	
Minow Islands -	5 0	15		Umm en Nakheī- }	7 30?	8?	
St. Juan de Nova -		5		lah - - }			
<i>Red Sea.</i>				Tahrí - -	5 0?		
Bab-el-Mandeb St.	12 0	7		Jezírat Kais -	0 45	7½	
Mocha Road (East } Coast) - }	12 0	4½		Jezírat Tumb -		8	
Masowah - -	1 0	3		Lingeh - -	12 0?		
Loheia - -	1 30	3		Básidúh - -	12 0	10	
Sale Macowa -	0 30	2		Kesm - -	11 0	12	
Jiddah - -		3		Jezírat Lárek -	10 15		
Murdounah Island }				Basrah Town -	6 0?	9	
(East Coast) - }	6 0	3		Jashk Shoal, }			
Omaider Island }				Beloochistan - }	9 30	8	
(Gulf of Akabah) }	6 0	4		Soonmianee Harb.	9 0	9?	
Rás Mahommed }				<i>Hindoostan, West Coast.</i>			
(Gulf of Akabah) }	6 0	5		Karáchi entrance	10 30	9½	6
Ushruffi Islands -	6 14	2		Gisri River "	9 45	10	
Suez Bay (head of } Gulf) - }	2 0	6		Piti River "	10 5	9	
<i>Arabia, S.E. Coast.</i>				Kúdi or Coondee } River "	9 50	10	
Bab-el-Mandeb }				Dubba River "	10 10	8	
Strt. (Perim Id.) }	12 0	7		Hajamri River "	9 40	8	
Bander Feikam -	10 0	8½		Kediwári River "	9 57	7	
				Waree River "	11 0	9½	

* From a survey of Aden anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

† Deduced from observations made in the E.L.C. brig Euphrates 1857-58, and H.M. schooner Marie of the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiffe of H.M. Indian Navy.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Seer River, entrance	10 30	11		Deoghur Harbour } (entrance) -	11 0	9	7
„ Juggee -	1 30	6		Angria Bank -	10 30	9	
Hukkar R., entrance	10 30	11		Vingorla -	11 0	8	5½
Kori or Lukput R.: (entrance) -	11 15	10½		Goa Bay -	10 30	7	5½
Lukput -	12 15	12		Sedashigar Bay* -	10 0	6½	5
Kotasir -	11 15	10½		Tudri River (Bar)	10 0	6½	5½
Gooria Creek -	11 0	8½		Mangalore -	11 0	7	8½
Mandavee Rds. } -	11 50	15	11	Tellicherry -	11 40	5	4
Toona -	1 50	16	13	Calicut -	12 15	4	3½
Hanstul Mouth -	2 0			Beyppore -	12 15	4	3½
Juria -	2 0	16	13	Cochin -	1 30	2½	2
Nowanugga -	1 45	18	14	Aulapolay -	2 0	3	1-3
Roji -	1 40	18	14	Lakadivh Group -	10 30	6	4½
Ajár -	0 50	14	11				
Assar Point -	12 0	12	8	<i>Ceylon, South Coast.</i>			
Seraia -	1 0	16	13	Colombo -	1 0	2	
Bate Harbour -	12 20	12	10	Dodandowe Bay -	1 50	1½	
Mouth of the } Gulf of Kutch.	11 30			Pointe de Galle -	2 0	2	
Rúpon -	10 30	10	7	Belligam or Red Bay	2 20	2½	
Pur Bunder -	9 45	6		Kirindi -	3 30		
Mangaról Bunder -	10 30	7	5	Batticalao River -	5 0	2-8	
M'hul Dwarka -	10 30	7		Trincomalie Har- } bour -	8 18	2	1½
Mandwa Creek -	10 45	7	5	Palmeira Point -	9 30	7-11	
Diu Harbour -	11 0	6	4½				
Jafrabad Harbour -	11 35	9	7	<i>Bay of Bengal, West Coast.</i>			
Shalbet Island -	12 0	9	7	Tuticorin Har- } bour and Road, } (Gulf of Manar) }	1 15	2½	1½
Mowah Bunder -	1 0	12	9½	Keelacarry -	11 0		
Goapnáth Point -	2 25	18	13½	Paumben Pass -	1 30	2	
Gogah -	3 50	Ord. Sp. 27 to 30	21	Kitnapatnam (West side of Palk Strait) -	11 0	1½	
Bhowliaree } Creek -	4 46			Negapatam -	5 0	3	
Singoteer Mata } Cambay } (Town) -	5 20	Night 30 Day 23	20-22	Nagore -	8 15		
Dhardur R. } (entrance) }	5 10			Madras Road -	7 34	3½	
Broach Point } (Nerbudda River) -	4 30	27		Pulicat Shoals -	9 25	2½	
Surat Roads -	3 40	25		False Point -	8 0	8	
„ (Town) -	2 45	19	15	Point Divy -		5	
Nosari Khari (Bar)	4 0	19		Coringa or Coca- } nada Bay }	9 10	4-5	3
Gundavi River -	3 0	18		„ River (Bar)	9 0	5	
Bulsar Khari -	2 0	19	15½	Balasore River -	10 0	15	
Omersari River -	1 45	18	14½	Kedgerree -	11 30		
Damaun (Bar) -	1 45	18	14½	Saugor Island -		12	6-9
Versovah -	1 30	17		Western light ves- } sel (entrance to } Hoogly) }	10 0	10½	
Bombay Dockyard	12 0	16	13	Mutlah River, } Western or } Ward's Channel }	9 0	10	
Rajpuri R. (entrance)	11 40	12-17		„ (entrance to } Biddah River) }	10 0	14	
Bankot or Sivitri } River -	10 40	11	6	„ (Muda Kali) }	11 45	15	
Boria Bay -	10 30	11	6	Kedgerree to Dia- } mond Harbour }		18½	
Ratna-ghiri -	10 0	10	8	Calcutta -	2 30	12-15	
Rájapur R. (en- } trance) }	10 30	8	6½				
„ (Town) }	11 0	9	7				
Gerlah or Viziadroog	12 20	7					
	11 0	9	7				

* Spring tides rise, a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

† In March and April.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
<i>Bay of Bengal, East Coast.</i>							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hastings Harbour } (Mergui Archipelago) -	10 40	14		Comoro Islands, } (Numa-Choa, Mohilla) -	3 0	14	
Mergui - -	10 30	18		" (Anchorage, Johanna) }	3 40	11	
Tavoy River, (entrance) }	10 30	20		" (Pomony Harbour, Johanna) -	4 0	11	
Maulmain " -	2 0	22	17	" Zaudzi Anchorage, Mayotta) -	4 10	12	
Martaban - -	2 20	21		Aldabra Islands -	5 0	10	
Rangoon R. (entrance)	3 15	21	14	Maldives, Adou Atoll }	1 0	4	
Rangoon - -	5 30	21	14	" Suadiva Atoll }	1 0	4	
Bassein River (entrance) - }	10 0	9	6	Maldives, Adou Matte Atoll }	3 0	4	
Ramree Road - -	10 0	12		" Malé -	12 30	3	
Kijouk Phyou Harbour - }	10 0	9	6	" Malcolm Atoll }	10 30	3	
Akyab, Aracan River (Bar) -	9 45	9	6	" Heawandou Pholo Atoll }	9 30	5	
Nafe River (entrance) - }	10 0			Laccadives, Cherbaniani Reef - }	10 0	7	4
Cheduba Island -	11 30	8		Ghubbet Gollon-sir, Sokotra - }	7 20	8	
Diamond Island -	10 30	8		Keeling Islands (Port Refuge) - }	5 30	5	
Chittagong (Bar) -	1 15	15	10	Christmas Id. -	10 0	.	
<i>Islands in Indian Ocean.</i>				Nicobar Islands, Nancowry Harbour - }	9 15	8½	
Kerguelen (Christmas Harbour) - }	2 0	2		Andaman Islands, Port Blair }	9 30	7½	
St. Paul Island -	11 0	3		" Port Cornwallis - }	10 0	8½	
Amsterdam Id. -	11 0	8		" Andaman Strait }	10 24	9½	
Mauritius, Port Louis - }	12 30	3	2½				
" Grand Port - - }	1 0	1½					
Reunion or Bourbon Island, (St. Pierre) }	Noon	3½					
Reunion or Bourbon Island, (St. Denis) }	0 22	2½					
" (St. Gilles) -	1 0	2½					
" (St. Paul) -	1 7	4					
Rodrigue Island -	1 45	6					
Cargados Carajos Shoals - }	2 0	4					
Chagos Archipelago, (Diego Garcia) - }	1 30	6					
Peros Banhos -	1 30	5					
Solomon Islands -	1 30	5					
Seychelle Archipelago, (Mayhé Island) - }	4 0	6½					
Curieuse Island -	5 10	7					
Amiranté Isles, (St. Joseph I.) }	5 0	8½					
Comoro Islands, (Maroni Bay, Comoro) - }	4 53	10					
" (Douany, Mohilla) - }	4 0	11-12					
				<i>Malacca Strait, Malay Coast.</i>			
				Junkseylon Island (East side) - }	10 0	11½	
				Queda - -	12 0	5½	
				Penang (Georgetown) - - }	12 0	9	7½
				Lt. Vessel (One Fathom Bank) }	6 0	15	12
				Arroa - -		10	
				Cape Rachada -	5 30	13	
				Sambilangs - -		12	10½
				Malacca Road -	7 30	11	8½
				Off Mount Formosa	8 0	11	8½
				Tanjong Bolus -	9 30	10½	8½
				North Sands -	5 30	15	12½
				Singapore, New Harbour - }	9 45	10	7½
				Rhio - -	10 0	7	5

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Malacca Strait, Sumatra Coast.				Sumatra, West Coast.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Diamond Point -	12 0	9½		Bencoolen -	6 0	3-5	
Siak River (entrance) -	9 0	12		Sillebar River (Bar)	6 0	4½	
„ off the town -		11		Mensular Island (S.E. end) -	6 0	4	
Timor.				Tappanoeely Harbour -	6 10	6	
Koepang -	11 0	9	6½	Acheen Head -	8 45	8	
Dilhi or Dielli -	1 0	6		Diamond Point -	12 0	9½	
Sumba or Sandelhout, North Coast.				Durian Strait.			
Nangamessie Harbour -	11 30	17	13½	Sabon Island -		10	
Palmedo Road -		15		Deep Point -	5 0	10	
Sumbawa.				Red Island -	5 0	10½	
Ragged Island -	8 10	3		Banka Strait.			
Sapie Bay -	1 0	10		Toboe Ali Point -	8 30 P.M.† 10 0 A.M.†	12	
Britannia Bay -	1 0	11-12		Lucipara Pass -	irr.	10	
Bima Bay -	Noon	6		Nangka Island -	7 0	9½	
Lombok, West Coast.				Cape Oelar -	6 30	12	
Ampanam Bay -	8 0	6		Bersiap Point -	6 30	12	
Peejow Bay -		10-12		Kalian Point -	8 17†	12½	
Baly.				Lobah Point -	11 0†	10	
Badong Bay (South Coast) -	11 0	9½		Gaspar Strait.			
Tebonkos Road (North Coast) -	5 0	6½		Pulo Mendanao -	2 30	4	
Java.				Pulo Leat -	2 30	4	
Pampang Bay -		7-8		Java Sea.			
Segoro Wedie Bay -	9 0	8-10		Crimon Islands -	8 0	6	5
Patytan Bay -	3 0	7		Celebes.			
Tylatiap Harb. (South Coast) -	8 45	3½		Macassar -	4 0	54½	
Tytando Inlet -	6 30	5	3½	Flores Sea.			
Wynkoops Bay (S.W. Coast) -	5 0	5½	4	Adenara, Flores -		8	
Zand Bay -	5 0	4¾		Moluccas.			
Bantam -		5		Batchian, Gilolo -	1 0	6	
Batavia -	10 0	2		Sanguir Island -		6	
Kalang Bayang Harbour -		2		Gèby, Fohou Island -		5	
Krakatoa -	7 0	4		Manganitoe Bay -	5 0		
Sumatra, N.E. Coast.				Limbé Strait -		5	
Pulo Aor -		5		Sannana Bay -		9	
St. Barbe -	6 0	6		Koelwatte Bay -		7	
Badas Id., Linga Bay* -	6 0 P.M.	12		Wahaay and Hati-ling Bays -	6 0	3-4	
Batoo Barra -	2 50	7-10		Bouro, Cajili Bay -	1 32	4½	
Dheli River -	3 0	8		Amboyna -	0 33	7	
				Saparocsa Island -		6	
				Cambing or Passage Island -	noon	6	
				Banda, Banda Islands -	4 0	6?	
				Dampier Strait -		11	

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig, Saracen.

† In S.E. Monsoon.

† In N.W. Monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Filipinas.</i>					<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Port Zebú - -	12 0	7		Balambangan Id. -	10 0	6-8?	
Port Bulnagan } O'sta Ana - }	12 0	5½		Unsang (Borneo, } N.E. Coast) - }	8 0	3½	
Port Iliolo -	12 0	5½		Ragged Point, } Borneo, E.Coast }		7	
Port San Jacinto, } Ticao Island - }	6 30	6		Pamarung Islands } (Borneo East }		8-10	
Mindanao (S. Point)	7 0	6		Coast) - - }			
Manila (Luzon) -	10 40	2½		Eran Bay (Pala- } wan, West }	10 10	6½	
Port Sual -		6		Coast) - - }			
Scarborough Shoal	11 0	5		Tay-bay-oo-bay }	10 15	6	
PortLaguimanoc „	1 30	5½		„ }			
Alabat Harbour „	10 0	9		Ooloogan Bay „	9 30	5½	
Paluan Bay (Min- } doro) - }		5		Mayday Bay „	9 55	3½	
Busainga(BuriasId.)	12 30	6		Port Barton } (Bubon Point) „ }	10 55	6	
<i>Loo Choo Islands.</i>				Pancol „	9 40	6	
Nafa-Kiang -	6 28	7		Bacuit Bay „	10 0	6	
Port Oonting -	6 35	8		Cavern Island „	9 30	5½	
Oho Sima, Vin- } cennes Bay - }	7 30	5½		Observatory } Island - }	11 0	5½	
„ Wild Wave } Bay - }	8 0	8		Ursula Island } (Palawan, East }	11 0	7½	
<i>Bonin Islands.</i>				Coast) - - }			
Port Lloyd, Peel } Island - }	6 8	3		Port Royalist -	11 0?	6½?	
New Port, Hills- } borough Id. - }	11 32	3½		Millman Island } (Palawan, West }	10 27	2¾	
<i>China Sea, East Coast.</i>				Coast) - - }			
St. Pierre, Island -		4		Casuarina Point, „	9 30	6¾	
RendervousIsland, } Borneo, S.W. }		8		Barren Island „	9 30	5½	
Coast - - }				Bird Island „	9 30	6	
Tanjong Api -		7		Tai-Tai Bay -	9 30	5¾	
Sarawak River } (Moratabas en- }	4 0	9	5½	Batanes, Bashee } Islands - }		4	
trance) - }				Port Kok-si-kon } (Formosa, East }	11 30	3	
„ Santubong -	4 0	10	6	Coast) - - }			
„ Sarawak } Junction }	5 0	15-18	9	Tam-Sui Harbour }	11 45	7-12	
„ „ City	5 20	15-18	9	„ }			
Burong Island -	4 45	7		Kelung Harbour } (Formosa, N. }	10 30	3	
Rajang River -	4 45	13	9	Coast) - - }			
Bruit River -	3 0	11		Sau-o Bay -	10 0	3½	
Bintula River -	5 45	6		<i>Babuyan Islands.</i>			
Labuan Island }				Port Pio Quinto, }			
Victoria Harb. }	9 45	6		Camiguin Island }	6 0	6	
Mungalum Island -	11 0	5		Port Musa, Fuga }		5	
Bruni River -	11 0	12		or New Babuyan }			
Dalawan Bay } (Balabac Is- }	11 0	5		<i>China Sea, West Coast.</i>			
land) - }				Romania Point, }			
North Balabac }				(Malay Penin- }	10 30		
Strait - }	10 50	5		sula, E. Coast) }			
Malludu Bay, }				Sedili River (en- }	9 44	7	
Borneo N. Coast }	10 30	6-8		trance) „ }			
				Blair Harbour „	8 50	9	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Pulo Timoan (West side) -	6 0	7½		Sam-shui, Si Kiang or West River. }		5-6	
Binkang Bay (Cochin China) -	11 30	5		Shao-king " -		3	
Tringano River (Gulf of Siam, West Coast) -	8 0	7		Wu-chu " -		1-1½	
Menam River, Paknam " }	5 7	9½		Hong Kong Road -	10 15	4½	
Cape Liant (Gulf of Siam, E. Coast) }	5 7	6½		Ninepin Group -	10 0	5	
Chentabun River (entrance) " }	10 0	5½		Tide Cove, Mira Bay	10 0	6½	
Rocky Island (Gulf of Siam, E. Coast) }	4 0	4		Tooni-ang Id. Bias Bay -	8 0		
Pulo Panjang	7 0	2		Tsang-chow Id. Bias Bay -	8 30		
Pulo Condore (Cochin China)* }	2 30	6½		Hong-hai Bay -	10 0	6½	
Saigon, Cochin China, Cape St. James -	11 0	8		Kin-siang Point, Hie-chechin Bay }	7 0		
" Saigon City	5 30	9½		Cupchi Point -	8 0		
Nhatrang Bay (Cochin China, E. Coast) -	8 30	5½		Swatau (Double Id.)	3 0	9	
Hon-cohe Bay "	11 30	5		Clipper Road, Namoa Id. -	11 15	7	
Turon Bay "	3 0	4		Chanan Bay -	11 0	6½	
Galong Bay }		4-5		Tongsang Harbour	11 30	12	
Hainan Island, }				Chimney Id. Rees Pass -	11 30	12	
Yu-tin-kan Bay -	9 5	2½		Makung Harbour (Pescadores) -	10 30	9½	7
Quan-chow-wan, Tongking Gulf }		9-10		Amoy, Inner Harb. -	12 0	18½	14½
Namo Harbour -	10 0	7½		Hu-i-tau Bay -	12 15	16	
Tien-pak Harbour (China, E. Coast) }	12 0	8½		Chimmo Bay -	10 20	16	
Hui-ling-san -	8 15	7½		Chinchu Harbour -	12 25	17	
Pratas Shoal -	4 0	5		Meichen Sound -	12 30	17	
Canton River (entrance) -	10 0	8		Hai Tau Strait -	12 15?	16?	
Broadway River (entrance) -	11 0	7½		White Dog Ids. -	9 0	18	
Typa Anchorage -	10 0	7		Min River, Temple Point -	10 45	19	14½
Macao -	10 0	6½		Min R., Losing Id. -	12 0		
Cumsingmun Harbour, Canton R. }	12 6	6½		Chang-chi Island -	9 30	17	
Junk Fleet entr., Canton River }	11 50	6½		Spider Island -	10 0	17	
Tailung Channel, "	4 30	6½		Lishan Bay -	10 15	16	
Lankeet Id., Canton River }	11 20	6½		Namquan Harbour -	10 0	17	
Lintin Id. "	12 0	7½		Namki Islands -	8 30	17	
Fan-si-ak Channel, "	1 0	7½	5	Pih-ki-shan Ids. -	8 30	17	
Chuen-pee Point, "	2 0	7½		Fong-whang-group, Bullock Harbour }	8 30	17	
† Whampoa Dks. { Mar. -	1 40	7-8		Wan-chu River (ent.) -	9 0	15½	
April -	1 15			" City -	9 30	15½	
May & June -	0 30			Towan Island -	9 20	13	
Kuper Id. { Mar. -	2 40	5½		Tai-chow Islands -	9 0	14	
off Canton City { May & June -	1 40	5½		St. George Id. } San-moon Bay }	10 20	15	
				Kweshan Islands -	9 30	14	
				Nimrod Sound -	10 30	20	
				Vernon Channel, Chusan Archipelago -	9 40	14	
				Ting-hae Harbour -	11 0	12	9
				Poo-too Island -	8 15	12	
				Lansew Bay -	10 0	13	
				Volcano Islands -	11 30	15	
				East Saddle Island -	11 0	14	
				Yung River, Chinhae -	11 20	12½	

* From a French Survey, 1862.

† At Whampoa Docks—In March, the day and night tides rise to the same level. From April to October, the day tides are the higher, and from November to February the lower. In May and June the level of spring tides is 4 feet, and the neaps 2 feet higher than in March.

Japan Sea.

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.
† Time and rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Oösima - - -	6 50	5		Port Gore - - -	9 0	8	6
Tanabé Ki Channel	6 0	6	5½	Pelorus Sound } (entrance) - - }	9 35	11	7
Uranouchi „ - -		5		Port Hardy - - -	9 55	8	6
Osaki „ - - -	5 55	6½		Croisilles Harbour	9 0	12	8
Hiogo and Corvi } Bays - - - }	7 15	5¾	4¼	Nelson - - - - -	9 50	14	10
Oösaka River (en- } trance) - - - }	7 30	5¾	4¼	Massacre Bay. } Tasman Corner }	8 45	13	9
„ City - - - - -	8 17	2½	½	—Motu Pipi } River, W. Ent. }	9 50	14	10
Kata Channel - - -	6 4	6½		Cape Farewell - -	9 20	14	10
Yura Harbour „ - -	6 5	6½					
Naruto (Fukura) „	6 17	7					
Akasi - - - - -	6 36	6½?					
Awasima (Inland } Sea) - - - - }	0 14	7					
Tomo (Seto-uchi)	11 0?		5				
<i>Gulf of Tartary.</i>				<i>Middle Island, South and West Coasts.</i>			
St. Vladimir Bay	irr.	2		Ruapuke Id. (Fo- } veaux St.) - - }	1 0	8	6
Napoleon Road } (West Coast) - }	2 30	2½		New River (Orete)	12 10	8	6
Port Michael Sey- } mour - - - - }	5 30	3		Centre Id. (Fo- } veaux St.) - - }	12 15	8	6
Barracouta Har- } bour „ - - - }	10 0	3½		Preservation Inlet	11 20	8	6
Castries Bay „ - -	10 30	6		Chalky Inlet - - -	11 5	8	6
Jonquiere Bay } (East Coast) - }	10 0	6		Dusky Bay - - - -	11 15	10	8
Amur Strait - - -	11 40	5 - 6		Daggs Sound - - -	11 30	8	6
Cape Maria (Sag- } halin Id.) Sea }	2 0	5		Thompson Sound -	11 30	8	6
of Okhotsk - - -				Bligh Sound - - -	10 45	8	6
				Milford Sound - -	9 15	8	6
				Wanganui Inlet - -	11 20	7	6
<i>Kamchutka.</i>				<i>North Island, South and West Coasts.</i>			
Avatcha Bay - - -	3 30	6½	4½	Port Nicholson, } Lambton Harbour }	4 30	5	3
<i>New Zealand:—South or Stewart Island.</i>				Mana Island - - -	7 0	8	6
Mason Bay - - - -	11 10	8	6	Kapiti Island - - -	9 0	6	
S.W. Cape - - - -	12 0	7	5	Manawatu River - -	10 0	8	6
Port Pegasus - - -	11 50	8	6	Wanganui River - -	10 15	8	6
Port Adventure - -	12 20	8	6	New Plymouth } (Taranaki) - - }	9 30	12	9
Patersons Inlet - -	1 10	8	6	Kawhia Harbour - -	9 30	12	
Port William - - -	12 45	8	6	Aotea Harbour - - -	10 0	12	9½
				Waikato River - - -	9 30	12	9
<i>New Zealand:</i>				Manukau Harbour } (entrance) - - }	9 30	13	10
<i>Middle Island, East and North Coasts.</i>				Whaingaroa Harb.	9 50	12	
Bluff Harbour - - -	1 18	8	6	Kaipara Harbour } (entrance) - - }	10 55	10	9
Molyneux Bay - - -	3 0	8	6	Hokianga River } (entrance) - - }	9 45	10	
Otago Harbour } (entrance) - - }	2 50	7	5	„ (Kokohu) - - -	10 15	10	7
Akaroa Harbour - -	3 24	8	6	Cape Maria Van } Diemen - - - }	8 0	7	
Port Lyttelton, } formerly Port }	3 50	7½	5½	Three Kings Is- } lands - - - }	8 0	7	
Cooper - - - - -							
Kaikora Peninsula	5 30	8	6				
Cape Campbell - - -	6 0	8	6				
Port Underwood - -	6 10	8	6				
Queen Charlotte } Sound (entrance) }	8 50	8	6				
				<i>North Island, East Coast.</i>			
				Cape Palliser - - -	6 0	6	
				Wairoa River - - -	6 45	7	4
				Hawke Bay } (Ahuriri Har- }	7 50	3	
				bour) - - - - }			
				Poverty Bay - - -	6 5	6	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
East Cape - -	8 55	7		Frederick Reef -	8 0	6	
Hicks Bay - -	9 0	7		Kenn Reef - -	8 0	5½	
Tauranga Harbour	7 10	6	4½	Middle Bellona Reefs	8 30	6	
Mercury Bay - -	7 21	7	5	Avon Isles - -	8 30	5	
Gt. Barrier Island } (Nagle Cove) - }	6 25	10	7	Chesterfield Islet -	8 30	5	
Auckland Harbour	7 5	11	9	Mellish Reef (Sand Cay) - - }	7 55	5 - 6	
Kawau Island - -	6 30	10	7	Thirsty Sound - -	10 45	12 - 18	
Wangari Harbour -	7 0	9	7	Port Bowen - -	9 35	16	
Tutukaka Harbour	7 0	9	7	Shoal Water Bay -	10 30	12 - 18	
Wangaruru Harbour	7 10	9	7	Broad Sound - -	11 0	20 - 30	
Bay of Islands, } (Motu Mea Islet) }	7 15	9	6	Swain Reefs - -	10 25	10	
Wangaroa Harbour	8 15	7		Percy Isles, Middle or No. 2 Island }	10 30	16	13
Cavalli Islands -	8 0	7		(West Bay) - - }			
Monganui Harbour	8 15	9	7	" South or No. 1 Islet, }	10 30	14	
Awani River - -	7 44	7		(N.W. Bay) - }			
Parenga-renga Harbour - }	7 54	7		West Hill - -	10 20	24	
<i>Australia, East Coast.</i>				Cape Conway - -	11 0	18	
Twofold Bay - -	10 0	7	5	Goold Island - -	6 45	6	
Botany Bay - -	8 15	7 - 8		Port Denison - -	9 30	6	
Jervis Bay - -	6 20	6 - 9		Upstart Bay - -	9 0	6	
Port Jackson, } North Head - }	8 15			Cleveland Bay - -	7 30	10 - 12	
Sydney - -	38	4½	4	Palm Isles - -		8 - 10	
Broken Bay - -	8 0	6 - 9		Dunk Island - -	9 28	6 - 10	
Newcastle or Port Hunter - }	9 45	6 - 7		Fitz-Roy Island -	9 15	7 - 12	
Port Stephen - -	9 0	6		Endeavour River -	8 0	5 - 10	
Manning River -	9 15	4		Trinity Opening, }			
Crowdy Head - -	9 15	5	3	Great Barrier Reefs - - }	9 15	7 - 12	
Port Macquarie -	8 56	4 - 5		Lizard Island - -	9 15	7 - 10	
Solitary Islands -	9 15	5	3	Willis Islets - -	8 0	6	
Clarence River } Head - - }	9 0	6	4½	Osprey Reef - -	8 36	6	
Danger Point - -	9 30	6	4½	Flinders Group -	9 15	8 - 12	
Shoal Bay - -	8 30			Cape Sidmouth - -	9 15	10	
Richmond River -	9 20			Cape York - -	11 15	10	7
Cape Byron - -	9 45	6		<i>Torres Strait.</i>			
Tweed River } (Danger Point) }	9 45	5 - 8		Sir Ca. Hardy Is. -	9 15	10	
Moreton Bay - -	9 30	8 - 7		Raine Island - -	8 10	10	
Brisbane Bay (Bar)	10 4	6	4½	Wallis Island - -	Irreg.	7	
Great Sandy Strait }	9 14	10	7	Cape Possession -	9 0	6	
(Woody Id.) - }				Possession Island -	1 0	9½	
Sandy Cape - -	7 50	6 - 8		Darnley Island - -	9 30	12	
Port Curtis - -	9 40	10 - 12		Bramble Cay - -	9 15	12	
Byron Bay - -	9 45	6		Murray Islands - -	9 30	10	
Wreck Reef, } (Bird Islet) - }	8 3	6		Adolphus Island -	12 15	10	
Cato Bank - -	8 0	6		Albany Islands }	12 15	10	7
Lady Elliot Islet -	9 0	7 - 8		(Port Albany) }			
Heron Islet, }	9 0	10		<i>Australia, North and North-West Coasts.</i>			
Capricorn Group }				Endeavour Strait, }	8 10	6	
Keppel Bay - -	9 30	9 - 14		E. Entrance - }			
Great Barrier Reef	8 48	7		Booby Island - -	4 30	8	
Sanmarez Reef - -	8 0	6		Albert River - -	7 30	10 - 13	3 - 8
				Wellesley Isles, In- vestigator Road }	8 0	9	
				Sir E. Pellew Isds.	7 30	4 - 7	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Beatrice Islet -	8 0	8		Champion Bay -	9 10	1	
Arnhem Bay -	8 10	6		Cockburn Sound -	9 0	1 - 1½	
Vanderlin Island -	9 30	7	4	Warnboro' Sound -		8 - 4	
Cape Wilberforce -	8 10	10		Rottneat Island, }	7 50	2½	
Liverpool River -	6 30	12		Thompson Bay }			
Goulburn Isles -	6 0	5 - 6		Koombanah Bay -	9 0	2	
East Alligator River	8 15	15		Swan River, Gage }	8 50	2½	
Adam Bay -	6 0	18		Road - }			
Shoal Bay -	6 0	18 - 25	14 - 20	" Port Grey	9 0	1 - 1½	
Port Essington -	3 24	13		<i>Australia, South Coast.</i>			
St. Asaph Bay -	5 45	14		Corner Inlet -	11 40	8	
Port Cockburn -	5 45	24		Wilson Promontory	2 0	10	
" Darwin -	5 30	17 - 24		Port Western, }	0 12	8½	6½
" Paterson -	4 0	16 - 24		Muscle Rk. }			
" Keats -	6 0	22		" Bouchier }	1 13	10½	8½
Pearce Point -	6 55	20 - 26		Channel }			
Victoria River, }	7 15	15 - 24		" French Id. }	1 0	10	8
Turtle Point - }			10	(Spit) - }			
" Holdfast Reach	9 0	16		Port Philip, Lons-	9 42	7	5½
" Mosquito Flat	0 19	7 - 13		dale Point }			
" Sandy Island	1 17	3 - 10		" Queens Cliff	10 50	3	2
Adolphus Island -	7 30	21		" Nepean Pt., }			
Vansittart Bay -	9 15	6		(Quarantine }	10 53	2½	1½
Swift Bay -	12 0	18		Station) - }			
Port Nelson -	12 0	27		" Dromana -	2 19	8	2½
Prince Frederick }	12 0	28		" Schnapper }	2 14	2½	2
Harbour - }				Point - }			
Careening Bay -	11 45	30		" Bellarine }	2 21	2½	2
Prince Regent }				Jetty - }			
River, St. George }	12 20	24 - 37		" Geelong }	2 30	3½	2½
Basin - }				(Bird Rock) }			
Hanover Bay -	11 30	24 - 38		" Hervey Point	2 39	8	2½
Camden Harbour -	11 30	30		" Williamstown	2 31	2½	2
Montgomery Isles	12 0	36		" Melbourne }			
Collier Bay -	11 45	36		(Quay near }	2 48		
Port Usborne, }	1 45	34		the Bridge) }			
King Sound - }				Lady Bay -		4	
Swan Point -	0 10	26		Port Fairy -		4	
King Sound (en-	0 10	33		Portland Bay -	Midnight	4	
trance) - }				Macdonnel Bay -	3 0	5	
Beagle Bay -	11 30	13 - 15		Rivoli Bay -	10 0	4	
Carnot " -	0 30	13 - 14		Port Elliot -		5 - 6	
Roebuck " -	0 30	30	18	Troubridge Shoals	3 30	6	
Turtle Isle (North)	11 0	18	6	Port Wakefield -	5 0	9	
Sandy Islet -	10 35	18		Port Adelaide -	5 44	6	
Depuch Isle -	10 40	14	6	Cape Willoughby, }			
Hermite Isle -	10 0	14		Kangaroo Id. - }	4 10	6	
Sharks Bay, Natu-	11 45	6		Pelican Lagoon, }			
raliste Channel }				Kangaroo Id. - }	5 0	6	
" Denham Sound	12 5	5		Spencer Gulf:			
" Freycinet Reach	3 0	5		Thorny Passage	12 0	6 - 8	
" " Estuary	4 15	8½		Point Riley -	5 45	4½	
" Bay, Cape }	12 45	5½		Plank Point -	6 15	6 - 8	
Perron - }				Port Pirie -	7 15	9 - 11	
" Hamelin Pool	5 0	3½		Point Webling	6 10	6 - 9	
				Point Lowly -	7 0	6 - 8	
				Port Augusta* -	8 30	9 - 12	
				Wallaroo -	irr.	4 - 5	
<i>Australia, West Coast.</i>							
Port Gregory -	11 30	8					
Houtman Rocks -	11 30	2½					

* At Port Augusta, when the wind veers round to West and South and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Gambier Islands -	1 50	3		Banks Ids., Port			
Port Eyre -	10 30	6		Patteson, Vanu	6 40	5	
St. Francis Isle, } Petrel Bay - }	12 0	6		Lava Id. - }			
Blancheport, } Streaky Bay - }	1 0	5		„ Ids., Port Sand			
Smoky Bay -	12 15	6		wich, Mali-	5 30	4	
Denial Bay -	12 15	6		collo Id. - }			
Fowlers Bay -	10 30	6		„ Vila Harbour, }	5 0	5	
Venus Harbour -	2 15	6		Sandwich Id. }			
West Cape Howe -	9 0	6		„ Havannah			
King George } Sound, Princess }	11 56	1 - 4		Harb. Sand-	7 15	4	
Royal Harbour }				wich Id. - }			
<i>Bass Strait.</i>				„ Dillon Bay, Er-	5 30	4	
Refuge Cove -	12 5	8		romango Id. - }			
King Island (Sea } Elephant Bay) }	9 30	12		Mboli Harbour, }			
Hunter Island -	11 30	8		Florida Island, }	5 30	6	
Three Hummock } Island, E. side - }	10 30	10		Solomon Ids. - }			
Swan Island -	9 35	6		Nairai Id. Fijii Ids.	5 53	4½	3½
Kent Island -	11 10			Moala „	5 50	5	
Murray Pass -	11 10	8		Matuku „	6 18	5	3
<i>Tasmania.</i>				Makongai and }	6 0	4	3
Circular Head -	11 40	9		Wakaya Ids. „ }			
Tamar River, Port } Dalrymple }	12 5	10	7½	Ono Ids. „	6 0	4	
(Georgetown) }				Tova or Na Vatu }			
Tamar River, } (Launceston) - }	1 0	12½		Reef - }	6 8	4	
Eddystone Point -	9 39	7		Vatoa or Turtle Id.	6 11	4	
Georges Bay -	9 42	3	2	Nandi Passage }			
Cape Pillar -	1 0	6		and Bay - }	6 35	4½	
Port Arthur -	7 52	4		Erronau or Futuna	7 24	4	
Hobarton -	8 15	4½	3½	Sandalwood Bay, }			
Macquarie Harb. -	7 30	3		Fijii Islands - }	6 0	6?	
<i>Islands in South Pacific.</i>				Port Nukulan or }			
Easter Island -	2 0			Rewa Road, }	6 47	5½	
Bow Island -	2 40	3		Fijii Ids. - }			
Tabuai Id. -		3		Balade Harbour, }			
Tahiti or Otaheite Id.	noon.	1½		New Caledonia }	6 30	4?	
Resolution Bay, }				Port Alcmène, Isle }			
Sta. Christina, }	2 30	4		of Pines, New }	8 6	4	
Marquesas - }				Caledonia - }			
Fannings Id. -		4		Prony Bay, New }			
Pago Pago, Navi- }		4½		Caledonia - }			
gator's Ids. }				Noumea Bay, New }	8 25	4	
Manna „		6		Caledonia - }			
Tongatabu -	6 50	4		Port St. Vincent, }	5 50	4½	
Port Resolution, }	5 35	8		New Caledonia }			
Tanna Island - }				Devarenne St., New }			
Port Inyang, }	6 35	4		Caledonia }		8½	
Aneiteum - }				Port Balad „	6 15	4½	
				„ Iengen „	6 15	4½	
				„ Uinne „	6 48	4½	
				Woodlark Island }			
				Louisiade Archip. }	7 15	4	
				Port Carteret, New }			
				Ireland - }		6	
				Lord Howe Island	8 30	6	
				Middleton Reef -	8 30	6	
				Norfolk Island -	7 45	7	
				Chatham Id., Port }			
				Hutt - }	6 50	6	
				Auckland Id. Port }			
				Ross - }	12 0	3	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Campbell Island } South or Perseverance Harb. - } Raoul or Sunday Id.	12 0 6 0	5? 5	3½? 				
Islands in North Pacific.				Tierra del Fuego, S.W. Coast.			
Karakoa Bay, } Owyhee - } Honoruru, Sand- } wich Islands - } Pouinipet Island, } Caroline Islands } Saipan Island, } (Ladrone Ids.)- } Pelew Islands -	3 49 4 0 6 0 6 45	2 4½ 2½ 6		Cape Horn - St. Francis Bay - St. Martin Cove - Middle Cove - Goree Road - Lennox Cove - Nassau Bay - Good Success Bay - Packsaddle Bay - Orange Bay - New-year Sound - Adventure Cove - March Harbour - Doris Cove - Stewart Harbour - Townshend Harbour - Fury Harbour - North Cove, Fury } Island - - } Hewett Bay - Bedford Bay - Smyth Harbour - Noir Island - Laura Harbour - Cape Castlereagh - Cape Gloucester - Cape Inman - Latitude Bay - Week Islands - Dislocation Harbour - Diego Ramirez } Islands - - }	4 40 4 0 3 50 3 30 4 0 4 40 4 0 4 3 3 30 3 30 3 10 3 10 3 0 2 50 2 30 2 30 2 30 0 30 0 30 12 0 2 30 1 0 2 50 1 30 2 0 2 5 2 0 1 40 4 0	9 8 8 6 6-8 6 5 4 6 4 5 4 4 6½ 7½ 6½ 5 6 4 5 4 4 5 4 6	
South America, Strait of Magellan.				Patagonia, West Coast.			
Cape Virgin - Cape Espiritu Santo Possession Bay - Cape Orange - First Narrows - Philip Bay, east side Gregory Bay - Second Narrows - Peckett Harbour - Laredo Bay - Santa Magdalena } Island - } Port Famine - Cape San Isidro - St. Nicolas Bay - Cape Froward - Port San Antonio - Labyrinth Islands- Port Gallant - York Road, } English Reach } Bachelor River - Borja Bay - Playa Parda Cove- Port Tamar - Valentine Harbour Harbour of Mercy- Cape Pillar -	8 30 8 30 9 0 3 0 9 0 9 30 9 45 10 0 12 0 11 30 12 0 12 0 1 0 2 6 1 0 12 0 0 30 9 0 2 0 1 40 1 50 1 8 3 5 2 0 1 22 1 0	36 - 42 36 - 42 36 - 42 36 - 42 24 23 23 6 9 10 6 8 7 5½ 5½ 9 5 7 5 4		Evangelists - Port Henry - " Barbara - San Tadeo River - Port San Domingo Piti-Palena - Tictoc Bay -	1 0 12 0 12 28 11 45 12 0 12 23 1 45	5 5 4 6 7 10 11	
Smyth, Sarmiento, Wide, and Messier Channels.				Chonos Archipelago.			
Goods Bay - Fortune Bay - Welcome Bay - Puerto Bueno - Guia Narrows - Fury Cove - Eden Harbour - Halt Bay - Middle Island -	0 30 0 50 0 50 1 40 2 10 1 15 12 30 0 30 12 0	7 7 7½ 8? 8 5 8		Port Otway - San Andres Bay - Port San Estevan Anna Pink Bay - Vallenar Road - Port Low -	11 37 0 45 0 15 0 45 0 18 0 40	6 5 5 5 5 7	
				Chilos Archipelago.			
				Huafo Island - Cucao Bay - Port San Carlos, } Town - - } Port San Carlos, } Pt. Arenas - }	12 0 12 0 11 15 0 14	7 6 6 6	

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	b. m.	ft.	ft.
Port San Carlos,	0 4		
English Bank - }			
Caremapu - -	0 50	10	
Petucura Rock -	0 50	16	
San Pedro Passage	0 30	9	
Huillard Inlet -	0 48	16-20	
Quelan Cove -	0 28		
Talcan Island -	1 3	15½	
Alan Island -	0 31	18	
Poqueldon Harbour	0 54	18	
Castro - -	0 11	18	
Dalcabue - -	0 26		
Changues Islands -	0 35		
Quicavi Bluff -	0 57	20	
Oscuro Cove -	0 55	20	
Lobos Head -	0 29		
Compu Inlet -	1 10	17	13½
Cullin Island -		20	
Huapilinao Head -	1 25	15½	
Reconlavi Inlet -	0 44	14	
Puluqui Island -	1 5		
Calbuco Fort -	1 18 or 0 47	18	
" Beach -	1 15	16	
Abitao Island -	0 50	18	
Tres Cruces Point-	1 15	16	
Chacao Bay -	0 40	14	
" Narrows -	1 15	16	
<i>Chile.</i>			
Coyhuin River -	0 52	21	
Port Valdivia -	10 35	5	
Mocha Island -	10 30		
Leubu River -	10 30	5	
Santa Maria Island	10 20	6	
Arauco Bay -	10 15	6	
Talcahuano -	10 14	5	
Maule River -	10 0	5?	
Toro Point .	9 45		
Valparaiso	9 32	5	
Juan Fernandez } Island - -}	9 30	4	
Pichidanguque Bay -	9 20	5	
Port Herradura -	9 8	5	
Coquimbo Bay	9 8	5	
Port Huasco -	8 30	6	4
Copiapo - -	8 30	5	
Port Flamenco -	9 10	5	
Lavata Bay -	9 20	5	
Grande Point -	9 45	5	
Paposo - -	9 40	5	
<i>Bolivia.</i>			
ConstitucionCove, } Moreno - }	10 0	4	
Port Mexillones -	10 32	3	
Cobja Bay -	9 54	4	
Paquique or San } Francisco Point }	9 45		

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
<i>Peru.</i>			
	h. m.	ft.	ft.
Iquiqui Road -	8 45	5	
Lobo Point -	8 0		
Arica Road -	8 0	5	
Ylo Road -	8 15	6	
Islay -	8 53	7	
Quilca River -	8 0	6	
Point Lomas -	8 19	5	
Atico Road -	8 53	5	
Port San Juan -	5 10	3	
" San Nicholas	5 15	3	
Independencia Bay	4 50	4	
PISCO Bay -	4 50	4	
Callao Bay -	5 47	4	
Huacho Bay -	4 45	3	
Supé Bay -	4 50	3	
Guarmey Bay -	6 10	2	
Samanco or } Guambachobay }	6 30	2	
Port Malabrigo -	5 0	2	
Lambayeque Road	4 0	3	
Port Payta -	3 20	3	
Malpelo Point -	4 0	10	
<i>Ecuador.</i>			
Sta. Clara Island -	4 0	11	
Morro,SandyPointof	5 0	11	
Puna Island -	6 0	11	
Guayaquil -	7 0	11	
St. Elena Bay -	1 18	8	
Salango Id. -	0 41	12	
Port Manta -	3 4	6	
Caracas River -	3 30	10	
Cape Pasado -	3 30	10	
Atacames Bay -	3 37	13	
Santiago River -	3 30	13	
Tumaca Road -	2 33	12	
Sanguianganga (en-trance) - }	4 10	9	
<i>Galapagos Islands.</i>			
Charles Island -	2 10	6	
Albemarle " -	2 0	6	
Chatham " -	2 23	6½	
Indefatigable " -	1 56	6	
James, I., West-end	3 10	5	
" N. side -	2 34	5	
" Adam Cove	2 14	5	
Tower Id. -	?	?	
Culpepper Id. -	?	?	
Wenman Isles -	2 10		
<i>New Granada and Veragua.</i>			
PortBuenaventura } (Negrilla Reef) }	4 0	13	
" off the Town -	6 0	13	
San Juan River -	6 0	12	
Cabita Bay -	3 40	12	
Port Utria -	4 0	12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cupica Bay -	3 30	13		Columbia River, } Entrance - }	0 15	7½	
Octavia Bay -	3 30	13		Astoria* -	0 42	7½	6
Pinas Bay -	3 15	14		Nee-ah Harbour* -	12 33	7½	6½
Chepo River -	3 40	16		Port Townshend* -	3 49	5½	5
Pedro Gonzales, } (Trapichi Id.)- }	3 50	16		Fort Steilacoom* -	4 46	11	9½
Chamé Bay -	4 0	16		<i>Vancouver Island, Juan de Fuca Strait, and British Columbia.</i>			
Saboga -	4 0	14					
Panama Road -	3 23	15 - 22	10 - 16				
Port Nuevo -	3 10	12					
Parida Island -	3 15	10½					
<i>Central America, West Coast.</i>				Sooke Harbour -	2 0	8	
Nicoya Gulf (Port Herradura)	3 9	10		Esquimalt Harb.† -	irr.	7 - 10	8 - 9
Port San Juan del } Sur - }	3 8?	10?		Victoria Harbour†	irr.	7 - 10	5 - 9
Port Realejo -	3 6	11		Inner Channels } leading from }	irr.	10 - 12	
Port la Union, } G. of Fonseca - }	3 15	10½	8½	Juan de Fuca } Strt. to Haro St. }			
Acajutla Road -	2 25	9		Griffin Bay, Haro }	irr.	12	
				Archipelago - }			
				Roche Harbour, }	irr.	12	
				Haro Strait - }			
				Port Discovery -	2 30	7	
				Nisqually, Puget }	6 0	18	15
				Sound - }			
				Fane Id., Plum- }	irr.	12	
				per Sound - }			
				Drayton Harb., }	2 0	12	
				Semiahmoo Bay }	6 30	7 - 10	
				Fraser River (entr.) }			
				Burrard Inlet, }	6 0	16	
				G. of Georgia - }			
				Plumper Cove, }	noon.	12	
				Howe Sound† }	noon.	12	
				Port Graves† -	6 0	10	
				Stuart Channel, }			
				(Oyster Harb.) }			
				" (Cowitchin }		10 - 12	
				Harbour) - }			
				Maple Bay -		12	
				Nanaimo Harbour }	5 0	14	
				G. of Georgia - }			
				Nanoose Harbour, }	5 0	15	
				Vancouver Id. }			
				Pender Harbour, }	6 0	13	
				Strt. of Georgia† }	5 0	12	
				Port Augusta -			
				Hernando Island, }	6 0	12 - 14	
				(Baker Passage) }			
				Strt. of Georgia }	6 0	12	
				Sturge Narrows -	7 0	14	12
				Rendevous Ida. -	6 0	12 - 14	
				Stuart Island -			
				Waddington Harb., }	6 0	13	
				Bute Inlet - }			
				Gowlland Harb., }	5 30	11	
				Discovery Pas- }			
				sage - }	4 0	11	
				Seymour Narrows }	3 0	16	11½
				Cameleon Harb., }			
				Nodales Channel }			

* From the U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

† May to October, from Midnight to 3 a. m. November to April from Noon to 3 p. m.

‡ From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Forward Harb., -	3 0	16	11½	Kyuquot Sound, }	12 0	12	
Beaver Creek, }				Vancouver Id. }			
Loughborough Inlet - }	3 0	16	11½	Esperanza Inlet „ -	12 0	12	
Topaze Harbour -	3 0	16	11½	Nuchatlitz Inlet „ -	12 0	12	
Knox Bay -	12 0	16		Nootka Sound, }	12 0	12	
Port Neville* -	0 30	17	12	Vancouver Id. }	12 0	12	
Port Harvey* }	0 30	10		Hesquiat Harb. „ -	12 0	12	
(Call Creek) - }				Barclay Sound, }	12 0	12	
Beaver Cove -		15		Island Harbour }	12 0	12	
Alert Bay, Cor- }		15		Clayoquot Sound -	12 0	12	
morant Id. - }							
Nimkish River -	0 30	14		<i>America, North West Coast.</i>			
Beaver Harbour* -	0 30	15½	11½	Duncan Bay, }	12 0	21	
Shushartie Bay† -		12		Chatham Sound }			
Bull Harbour, }	0 30	12½		Port Kuper -	1 40	13	10½
(Goletas Channel)† }				Port Simpson -	0 35	21½	14½
Blunden and Tra- }				Portland Inlet, }	1 8	16	
cey Harbours, }	12 0	16	11½	(Salmon Cove) }			
Queen Charlotte Sound - }				Sitka† -	0 34	5-7	
Cypress Harbour, }	12 0	16	11½	Behring Bay -	0 30	9	
Sharp Passage }				Port Etches -	1 15	9½	
Deep Harbour, }	12 0	16	11½	„ Chalmers -	1 0	13½	
Fife Sound - }				„ Chatham -	1 0	12	
Cullen Harb. „ -	12 0	16	11½	Ounalashka Island	7 30	7½	
Quatsino Sound, }	11 0	11		Cape Roshnoff -	7 30	15	
Vancouver Id. }				Good-news Bay -	6 15	13½	
Klaskino Inlet -	12 0	12		Golovnin Bay -	6 23	3½	
Klaskish Inlet „ -	12 0	12		Port Clarence -	4 25		
Nasparte Inlet „ -	12 0	12		Chamisso Island -	4 42		
Ou-Ou-Kinsh }	12 0	12		Point Barrow -	11 45	½ - ¾	
Inlet „ }							

* From observations made in May.
† From observations made in the month of October.
‡ The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation (1862), the local pilots say that the rise sometimes is as much as 16 feet.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS
AT THE PLACES GIVEN IN THE PRECEDING PAGES;
ARRANGED ALPHABETICALLY;

*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what is given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Abaco, Bahamas - -	8 0	3		Agadir, or Santa Cruz, Africa.	12 45	9	
Abbey Head, England -	11 10	23	17½	Aggerminde, Jutland -	4 9	2	
Abd-ul Kuri, Indian Ocean	8 30	6		Agnes, St., Scilly Isles -	4 30	16	
Aberdeen, Scotland - -	1 0	12	10	Agulhas Cape, Africa, S. Coast.	2 50	5	
Aberdovey, Wales - -	8 0	15		Air Point, River Dee, England.	10 54	25	
Abervrach, France - -	4 14	22	16	Aix, Ile d', Charente R., France.	3 20	17	
Aberystwyth, Wales -	7 31	13½	10	Ajár, Hindoostan, W.C.	0 50	14	
Abrolhos, Brazil -	3 20	6-7		Akaroa Harb., New Zealand.	3 24	8	
Abtao I, Patagonia, W.C.	0 50	18		Akasi, Japan Sea -	6 36	6½?	
Abú-shehr, Persian Gulf	7 30	7		Akyab, Aracan R., Bay of Bengal.	9 45	9	
Acajutla, Central America	2 25	9		Al Bidá, Persian Gulf -	8 30?	6?	
Acapulco, Mexico, W. Cst.	3 6	1¼		Alabat Harbour, Luzon -	10 0	9	
Acheen Head, Sumatra -	8 45	8		Alan Island, Patagonia, W. Coast.	0 31	18	
Achillbeg, Ireland - -	5 14	10¾	8	Albany Ids. (Port Albany) Australia, E. Coast.	12 15	10	
Adam Bay, Australia, N. Coat.	6 0	18		Albemarle Id., Galapagos Islands.	2 0	6	
Adams Port, (Mary Id.) Yellow Sea.	2 0	10		Fort, Falkland Islands.	7 15	7	
Adelaide Port, Australia, S. Coast.	5 44	6		Albert River (Kangaroo Point) Australia, N. Coast.	7 30	10-13	3-4
Aden and adjacent Bays, Arabia, S. E. Coast.†	{ 7 30 to 9 30 }	7	4½	Alcmène Port, Isle of Pines, New Caledonia.	8 6	4	
Adenara, Flores, Malay Archipelago.		8		Aldabra Ids., Mozambique	5 0	10	
Admiralty G., Australia, N.W. Coast.	12 0			Aldborough, England -	10 45	87	6½
Adolphus Id., Australia, N.W. Coast.	7 30	21		Alderney, English Chan-	6 46	17	12
Adou Atoll, Maldives -	1 0	4		Alert Bay, Cormorant Id., Johnstone Strait, Vancouver Id.		15	
Adou Matte Atoll, Maldives.	3 0	4		Alexander Port, Africa, S.W. Coast.	3 0	5	
Adventure Cove, Tierra del Fuego.	3 10	4					
Port, New Zealand.	12 20	8	6				
Sound, Falkland Islands.	5 30	5½					

* By the Rise of the Tide is meant its vertical rise above the mean low-water level of Spring Tides.
† From a Survey of Aden Anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Algeçiras, Spain -	1 49	4	2½	Antonio St. Port, Patagonia, E. Coast.	10 45	18-30	
Algoa B., Africa, S. Cst.	3 5	6½		— St. Port, Magellan Strait.	12 0	7	
Alligator Rvr. Australia, N. Coast.	8 15	15		Antrobus Id., G. St. Lawrence.	10 30	5	3
Alloa, Firth of Forth, Scotland.	3 18	17½	15	Antwerp, Belgium - -	4 25	15	
Altona, Germany - -	5 19	7		Aor Pulo, Sumatra, N.E. Coast.		5	
Amboyna, Moluccas -	0 33	7		Aotea Harb., New Zealand	10 0	12	9½
Ameland Gat, Netherlands	9 0	7		Apalachicola B., Gulf of Mexico.		2½-4	
— Hollum Rd., „	11 30	7		Appetetat B., Gulf St. Lawrence.	11 10	5?	3?
Amet Sound, Nova Scotia	10 30	8	5	Appin Port (Loch Linnhe), Scotland.	5 26	12½	8½
Amiranté Isles, (St. Joseph Id.) Indian Ocean.	5 0	8½		Appledore, England -	5 28	23	16½
Amlwch, Wales - -	10 30	18?	13?	Aquin Bay, St. Domingo	irr.	2-3?	
Amoy (Inner Harbour), China, East Coast.	12 0	18½	14½	Aracan R. (Bar), Bay of Bengal, E. Coast.	9 45	9	6
Ampanam B., Lombock -	8 0	6		Aracati, Brazil - -	6 0	8	6
Amsterdam, Indian O. -	11 0	3		Araish El, Africa, N. Cst.	1 30	9-12	
Amulgawein, Persian G.	11 40	6		Arasaig, Scotland -	5 50	13½	10
Amur Strait, G. of Tartary	11 40	5-6		Arauco Bay, Chile - -	10 15	6	
Andaman Ida., Port Blair, Indian Ocean.	9 30	7½		Arbroath, Scotland -	1 35	14	11
— Port Cornwallis	10 0	8½		Arcachon, France - -	4 37	11½	9½
— Strait, Indian Ocean.	10 24	9½		Arcas Rks. G. of Mexico	noon	1½	
Andrava B., Madagascar	3 30	7		Ardglass, Ireland -	11 0	16	12
Andres, San B., Patagonia, W. Coast.	0 45	5		Ardintallan, Loch Feochan, Scotland.	5 31	9	6½
Andrews, St., Bay, G. of Mexico.	irr.	1-2		Ardrihaig, Loch Fyne -	11 53	9	7½
— New Brunswick	10 50	25	21	Ardrossan, Scotland -	11 45	10	8
Aneгада, Virgin Islands	9 0	1½		Arenas Pt., San Carlos, Patagonia, W. Coast.	0 14	6	
Aneiteum (Port Inyang), S. Pacific.	6 35	4		Argyle, Bay of Fundy -	9 27	12½	10½
Angoxa River, Africa, E.C.		13		Arica Road, Peru - -	8 0	5	
Angra, Azores - -	12 32	4½		Arichat, Nova Scotia -	8 10	5	4
— Pequena, Africa, S.W. Coast.	2 30	8		Arinagour, Coll Id., Scotland, W. Coast.	5 39	12½	9½
Angria Bank, Hindoostan, W.C.	10 30	9		Arkangel, White Sea -	7 28	2½	
Anna Pink B., Patagonia, W. Coast.	0 45	5		Arklow, Ireland - -	8 45	4	3
Annan Foot, England -	11 56	20	14	Arnhem B., Australia, N.C.	8 10	6	
Annapolis, United States	4 38	1	1	Arroa, Malacca Strait -		10	
Anne, St. B., Cape Breton	8 34	6	4½	Arthur Port, Tasmania -	7 52	4	
Annisquam, United States	11 0	10½	9	Arundel, England -	12 25		
Anno Bom Id., Africa	3 45	5		— (Bar) - -	11 35	16	11½
Anticosti Id., G. St. Lawrence, East Cape -	1 0	5	3	As Rocas, S. Atlantic -	5 15	10	
„ Bear Bay -	1 10	5	3	Asaph St., B., Australia, N. Coast.	5 45	14	
„ West Point -	2 0	6	4	Ascension Id., S. Atlantic	5 30	2	
Antigonish Harb. R. St. Lawrence.	9 0	4	2	Askaig Port, Islay -	4 58	6½	4
Antigua Id. (English Harb.), Caribbean Sea.		2		Assar Point, Hindoostan, W.C.	12 0	12	8
Antongil Bay (Port Choiseul), Madagascar.	4 0	5		Astoria, Oregon -	0 42	7½	6
Antonio Cap: St., Cuba		1½		Atacames Bay, Ecuador	3 37	13	
— River, Africa, E. Coast.	3 15	13	10	Atchafalay Bay, G. of Mexico.	irr.	2-2½	
				Athline, Loch Seaforth -	6 16	15	10
				Atico Road, Peru - -	8 53	5	
				Auckland Harb., New Zealand, N. Island.	7 5	11	9

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Auckland Id., S. Pacific (Port Ross).	12 0	3		Banana Ids., Africa, W.C.	8 15	9	
Augustine St., U. States	8 21	5	4	Bankot or Sitri R., (en- trance) Hindoostan, W.	10 30	11	6
—— St., B., Mada- gascar, W. Coast.	4 30	13		Coast.			
Aulapolay, Hindoostan, W. Coast.	2 0	3	1-2	Banda, Moluccas -	4 0	6?	
Antezavick Sound, La- brador.		5		Bander Alúleh, G. of Aden	6 45	6	
Aux Cayes Bay, St. Domingo.	irr.	2-3?		—— Gorí, Gulf of Aden	8 45		
Avatcha B., Kamchatka -	3 30	6½	4½	—— Sháab, Ind. Ocean	7 0	7	
Avon Isles, Australia, E.C.	8 30	5		—— Feikam, Arabia, S.E. Coast.	10 0	8½	
Avon River, Bigbury Bay, England.	5 47	16½	11½	Banff, Scotland - -	0 28	10½	8
Awasma (Inland Sea) Japan.	0 14	7		Bantam, Java - - -		5	
Awanui R., New Zealand	7 44	7		Bantry Harb., Ireland -	3 47	10	7½
Axim, Africa, W. Coast-	4 30	4		Baracoa, Cuba - - -	7 23	2½	
Aylen Bay, Yellow Sea	2 30	6	4	Barataria Bay, Gulf of Mexico.	irr.	1½	
Aymaun, Persian Gulf -	11 20	6		Barbados, Caribbee Ids.	irr.	2	
Ayr, Scotland - - -	11 50	8½	7½	Barbara Port, Patagonia, W. Coast.	12 28	6	4
—— Point of, I. of Man	11 7	20?	16?	—— I Santa, California	8 0	3½	
Bab-el-Mandeb, G. of Aden	12 0	7		Barbe St., Sumatra, N.E. Coast.	6 0	6	
Bachelor R., Magellan St.	1 40	5		—— Sta. Id., California	8 0	3½	
Bacuit B., China Sea, E.C.	10 0	6		Barclay Sound (Island Harb.), Vancouver Id.	12 0	12	
Badas Id., Linga Bay, Sumatra.*	6 0 PM	12		—— Uchucklesit Har- bour, Vancouver Id.		12	
Badong B. (S. Cst.), Baly	11 0	9½		Bardsey Id., Wales -	7 40	15	
Bagroo River, Sherbro River, Africa.			11	Barfleur, France - -	8 51	17	14
Bahia, Brazil - - -	4 15	8		Barmouth, Wales - -	7 41	17	17
Bahreïn, Persian Gulf -	5 30	7		Barnstable, United States	11 22	10	5
Balabac Id., China Sea, E. Coast.	11 0	5		Barnstaple Bar, England	5 30	19	14
Balad Harb., New Cale- donia.	6 15	4½		Barnstaple Bridge, Eng- land.	6 28	10½	7
Balambangan Id., Borneo, N. Coast.	10 0	6-8		Barquero (entrance), Spain, N. Coast.	3 0	15	
Balasure R., B. of Bengal, W. Coast.	10 0	15		Barra, Id. (North Har- bour), Scotland, W. C.	8 48	11½	7
Balbriggan, Ireland -	10 40	11		—— Castle Bay, Scot- land, W.C.	5 44	11½	5
Bald Head, United States	7 26	5	4½	—— Head, Bernerad Id., W. Coast of Scotland.	5 45	11½	
Ballachulish (Loch Leven), Scotland.	5 43	11		Barracouta Harb., G. of Tartary.	10 0	3½	
Ballinacourty, Dungarvan, Ireland.	5 12	12½	9½	Barragan Bay, Rio de la Plata.†	7 0	5-9	
Ballinskellig Bay, Ireland	3 40	12	7½	Barren Id., China S., E. C.	9 80	5½	
Ballycastle B., Ireland -	6 25	3	2	Barren Ids., Madagascar	4 45	12	
Ballycottin, Ireland -	4 54	12	9½	Barrow Harbour, New- foundland.	7 10	5-6	
Ballycrovane, Kenmare River, Ireland.	3 42	10½	7½	—— Point, Arctic Regions	11 45	4-7	
Ballynakill Bay, Ireland	4 40	12½	9½	Barry Id., Wales -	6 39	35½	2
Ballyness (Bar), Ireland	5 22	11½	8½	Barton Port, (Bubon Point), China Sea E.C.	10 55	6	
Ballysadare (Quay), Ireland.	6 0	8½	5½	Bas, Ile de, France -	4 49	23	17
Ballyshannon (Bar) -	5 18	11½	8½	Básidúh, Persian Gulf -	12 0	10	
Ballyweel, Ireland -	5 23	12½	8	Basil Bay, Korea, W. C.	4 15	18	1
Balta, Scotland - -	9 45	6	4½	Basque Port, Newfound- land.	8 55	5½	
Baltimore, Ireland - -	4 23	10½	8½	Basrah (Bar), Persian Gulf.	12 0		
—— United States	6 33	1½	1½				

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig Saracen.

† In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 ft.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Basrah Town - -	6 0?	9?		Bencoolen, Sumatra -	6 0	3-5	
Bassein R., Bay of Bengal.	10 0	9	6	Benevente, Brazil -	3 0	5	
Batanes, Bashee Islands, China Sea, E. Coast.		4		Benguela, Africa, W. Cst.	2 30	5?	
Batavia, Java - -	10 0	2		Benin R., Africa, S. Cst.	4 30	7	
Batchian, Gilolo, Moluccas	1 0	6		Benton Castle, Cleddau River, Wales.	6 23	20	14½
Bate (Gulf of Kntch), Hindoostan, W. Coast.	12 20	12	10	Berbereh or Burburra (Gulf of Aden) Africa, E. Cst.	7 15	9	
Bathurst, G. St. Lawrence	3 15	7	4	Berbice, Guayana -	4 30	11?	6?
Bathz, Netherlands -	3 15	15		Bergen, Norway - -	1 30	4	
Batiscan, R. St. Lawrence	9 48	3½	2	Berkeley Sound, Falkland Islands.	5 0	7	
Batoo Barra, Sumatra -	2 50	7-10		Bermudas: Ireland Id., N. Atlantic.	7 14	4	
Batticalao River, Ceylon	5 0	2-3		Bernera, Loch Roag, Lewis Id.	6 11	11	8
Bawdsey Haven (see Woodbridge Haven).				Berneray I., Sound of Harris.	6 11	13	9½
Bay of Harbours, Bull Road, Falkland Islands.	6 0	5		Bersiap Point, Banka Strait.	6 30	12	
Bay of Islands, (Motu Mea Islet,) New Zealand.	7 15	9	6	Bersimis R., Gulf St. Lawrence.	2 0	12	7
Bay of Mercy, Banks Land		2		Berwick, Scotland -	2 18	15	11½
Bayonne (Bar), France -	3 45	12	10	Betcheween Harb., G. St. Lawrence.	11 32	5	3
Bazaruto Cape, Africa, E. C.	4 15	10		Beypore R. (entrance), Hindoostan, W. Cst.	12 15	4	3½
Beachy Head, England -	11 20	20	15	Bhowliaree Creek, Hin- doostan, W. C.	4 46	30	23
Beagle Bay, Australia, W. Coast.	11 30	13-15		Bias Bay (Tooniang Id.,) China E. Coast.	.8 0		
Bear Cape, Prince Edward Island.	9 0	6	3	—— (Tsangchow Id.) China, E. Coast.	8 30		
Bear Head, C. Breton Id.	8 30	4½	3	Bic Id., G. St. Lawrence	2 15	14	6½
Beatrice Islet, Australia, N. Coast.	3 0	8		Biddah R., B. of Bengal, W. Cst.	10 0	14	12
Beaubère Id., Gulf St. Lawrence.	6 30	6	4	Bideford, England -	6 7	16	
Beaufort, United States -	7 26	3½	2½	Bijouga Islands, Arcas Channel, Africa, W. Cst.	10 10	11-14	9
Beaulieu, England -	{ 10 25 12 15 }	{ 10 21½ }	{ 8½ 16½ }	—— Bissao, Africa, W. Cst.	11 0	8	
Beaumaris, Wales -	10 32	15		—— Orango Channel, Africa, W. Cst.	10 0	11	
Beaver Cove, Vancouver Island.		16	11½	Bilbao (Bar), Spain -	3 0	13	
—— Creek, Loughbo- rough Inlet, B. Columbia.	8 0	16	11½	—— (Town), „ -	3 20	9	
—— Harbour, Van- couver Island.	0 30	15½		Biloxi, G. of Mexico -	irr.	2	
—— Nova Scotia -	7 40	6½	4½	Bima Bay, Sumbawa -	Noon.	6	
Bedeque Harbour, Prince Edward Island.	10 15	7	5	Binkang B. China Sea, W. Cst.	11 30	5	
Bedford Bay, Tierra del Fuego.	0 30	7½		Binnic, France - -	6 3	30	22½
Behring Bay, America, N.W. Cst.	0 30	9		Bintula R., China Sea, E. Cst.	5 45	6	
Belfast, Ireland - -	10 43	9½	8	Bird Island, China Sea, E. Cst.	9 30	6	
Belgrano Port, La Plata	6 0	12	10	—— Ids., Africa, S. Cst.	4 0	4-5	
Bell Sound, Spitzbergen	8 56	3½	2½	—— Id. Light, United States.	7 59	5½	4½
Belles Amour B., Labrador	9 0	4½		Blaavand Point, Jutland	1 44	5	
Belligam Bay, Ceylon -	2 20	2½		Black Ball Harb., Ireland	3 40	9½	7½
Bellona Reefs (Middle), Australia, E. Coast.	8 30	6					
Bembatooka Bay, Mada- gascar, W. Cst.	4 30	16					
Bembridge Pt., England	11 0	14	10½				
Benbecula, Scotland -	6 3	11½	8½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Black Rock, Bay of Fundy	11 29	36	31	Boughton Harb., Prince	8 40	5	3½
Blacksod Bay (Quay), Ire- land.	4 47	10	8½	Edward Island.			
Blacktoft, River Humber	6 59	16		Boulogne, France -	11 25	25	19½
Blair Harb., China Sea, W. Cst.	8 50	9		Bourbon Id., Indian Ocean, <i>see</i> Reunion Id.			
Blakeney, England -		9		Bouro (Cajili Bay) Mo- luccas.	1 32	4½	
—— (Bar) „	6 30	15		Bow Island, S. Pacific -	2 40	3	
Blanche Port, Streaky Bay, Australia, S. Coast.	1 0	5		Bowen Port, Australia, E. Cst.	9 35	16	
Blankenberg, Belgium -	12 48	13	11	Bowling, R. Clyde, Scot- land.	0 39	9	
Blanco Cape, Africa, W. Coast.	11 46	6		Boyanna B., Madagascar, W. Cst.	4 30	15	
Blas, San, Mexico, W. Cst.	9 41	6½		Bradore Bay, Labrador -	8 45	4	2
—— La Plata -	2 0	12	10	Braha Harbour, New- foundland.	7 0?	2-3?	
Basket Islands, Ireland -	3 30	11½	8	Bramble Cay, Torres Strt.	9 15	12	
Blewfields, Mosquito Coast	1 50	2		Brandy Pots, River St. Lawrence.	3 0	17	10
Bligh Sound, New Zea- land.	10 45	8	6	Brass River, Africa -	4 0	6	
Blind Bay, Nova Scotia	7 46	7½	6	Brava, Africa, E. Cst. -	4 30	8	
Block Id., United States	7 36	3½	2½	Bray Head, Ireland -	10 45	12	2
Bluff Cay, Bahamas -	7 0	4½		Brazos River, G. of Mexico	irr.	1½	
Bluff Harb., New Zealand	1 18	8	6	Bréhat, France - -	5 51	31	24
Blunden Harbour, Brit. Columbia.	12 0	16	11½	Brest, France - -	3 47	19	1½
Blyth, England - -	3 15	15	11	Bridgeport, United States	11 11	8	6½
—— R., Southwold, England.	10 20	6½	4½	Bridgewater (Bar) England	6 50	35	56½
Boca de Varadero, Cuba	8 39	2		Bridlington, England -	4 39	16	12
Bodega Port, California	11 17	4½	3½	Bridport, England -	6 5	11½	7
Bodkin Light, United States.	5 42	1½	1	Brielle, Netherlands -	3 0	5	
Bojador Cape, Africa -	12 0	8?		Brig Bay, Newfoundland	9 46	5?	
Bolt Head, England -	5 45	15?	11?	Brighton, England -	11 15	19½	16
Bombay Dockyard, Hin- doostan, W. Coast.	11 40	12-17		Brisbane (Bar), Australia	10 4	6	4½
Bonacca Id., Bay of Hon- duras.	9 0	1½		Bristol (King Road) Eng- land.	6 56	44	35
Bonanza, Spain - -	2 0	12½	8	Britannia Bay, Sumbawa	1 0	11-12	
Bonne Esperance Harb., G. of St. Lawrence.	9 15	5	2½	British Sound, Mada- gascar, E. Cst.	4 0	9½	
Bonny R. C., Africa, Wst.	5 0	9		Broad Sound, Australia, E. Cst.	11 0	20-30	
Booby, Island, Australia, N. Coast.	4 30	8		Broadhaven Har., Ireland.	5 0	10½	5
Bordeaux, France -	6 50	14	12½	Broadway R. (entrance), China, E. Coast.	11 0	7½	
Boria Bay, Hindoostan, W. Coast.	10 0	10	8	Broken Bay, Australia, E. Coast.	8 0	6-9	
Borja B., Magellan Strait	1 50	7		Broom Loch (Ullapool)	6 40	14½	1½
Borkum (Road) Germany	10 30	8-10		Broughty Ferry, Scotland	2 22	14½	11
Boscastle, England -	5 15	25	17½	Brouwershaven, Nether- lands.	2 15	10	5
Boston (Sluice), England	7 0	12		Bruit River, Borneo -	3 0	11	
—— Deep (Clay Hole) „		21½		Bruni R., China Sea, E. C.	11 0	12	
—— Hob Hole „ -		17		Brunsbittel, Germany -	1 58	9	
—— (Charlestown Naval Yard) United States.	11 27	11½	10	Brunswick B., Australia, N. W. Coast.	12 0	24	
—— Light, United States	11 12	11	9½	Brush, Yarmouth, England		5½	4½
Botany Bay, Australia, E. Cst.	8 15	7-8		Bubon Point, Port Barton, China Sea, E. Coast.	10 55	6	
Boteler R., Madagascar -	4 30?	15?		Buctouche River, G. St. Lawrence.	3 30?	4?	2½
Boucaut, France - -	3 39	8½	6	Budehaven, England -	5 45	23	17

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Buenaventura Port, Central America (Negrilla Reef).	4 0	13		Calcasieu Fort, Patagonia, W. Coast.	$\left\{ \begin{array}{l} 1\ 18 \\ 0\ 47 \end{array} \right.$	18	
„ off the town -	6 0	13		— River, Gulf of Mexico.		2½	1½
Buenos Ayres, S. America, E. Coast.*	12 0	3-5		Calcutta, Bengal -	2 30		
Buffalo R. (entrance), Africa, S. Cst.	3 45	4½		Caldy Road, Bristol Channel.	6 0	24?	16?
Bulama Island (Arcas Channel), Africa, W. Coast.	10 10	14	11	Calebar R., Africa, W. Cst.	5 0	9	
Bull Harbour, Goletas Channel, Vancouver Id.	0 30	12½		Caledonia Harbour, New Granada.	11 40	1½	1
Bull Id., Newfoundland	7 22	3½	2	Calf Sound, Isle of Man-Calicut Roads, Hindoostan, W. Coast.	11 17	16½	13
Bulls Id. Bay, United States	7 16	5½	4½		12 15	4	3½
Bulls Mouth (Achill Sound, N. entrance), Ireland.	5 38	10½	7½	Callao Bay, Peru -	5 47	4	
Bulsar Khari, Hindoostan, W. Coast.	1 45	18	14½	Calshot (Castle Pt.), England.	11 30	13	9½
Baluagan O'sta Ana Port, Filipinas.	12 0	5½		Calstock, R. Tamar, England.	6 6	12½	8½
Banawe (Loch Etive), Scotland.	7 54	5½		Camaguin, Babuyan, Ids.	6 0	6	
Buncrana, Ireland -	5 40	16		Camariñas Port, Spain -	3 0	15	
Bunessan, Scotland -	5 24	12	8½	Cambay (town), Hindoostan, W. Coast.	5 20	day 23 night 30	
Burburra, see Berbereh.				Cambing, Banda Sea, noon		6	
Burin Harbour, Newfoundland.	8 45	6½	4½	Camden Harb., Australia, N.W. Coast.	11 30	30	
Burntisland, Firth of Forth, Scotland.	2 24	16½	12½	Cameleon Harb., Nodales Channel, B. Columbia.	3 0	16	11½
Burnt Isles, Kyles of Bute, Scotland.	11 50	10	8	Cameroon R., Africa, W. Coast.	4 0?	6	
Burong I., China Sea -	4 45	7		Campbell Cape, New Zealand.	6 0	8	6
Burrard Inlet, Gulf of Georgia, B. Columbia.	6 0	16		— Island, South Pacific.	12 0	5?	3½?
Burry Port, Wales -	6 1	25½	18½	— Town, Gulf St. Lawrence.	4 0	10	7
Busainga, Burias Island	12 30	6		Campbellton, Scotland -	11 45	8½	6
Bushire, see Abú-shehr.				Campeche, Yucatan -	1 45	2½	2
Bussorah R. Bar, Persian Gulf.	12 0			Campobello (Welchpool), B. of Fundy.	11 21	23½	20
Button Islands, Hudson Strait.	6 50	-		Cancale, France -	6 20	37	27
Byron Bay, Australia, E. Coast.	9 45	6		Canna Id., Scotland, W. Coast.	6 19	14	9½
— Cape, Australia, E. Coast.	9 45	6		Canso Gut (North entr.)	9 15	4	2
Cabifa Bay, New Granada.	3 40	12		— (Plaister Cove), Nova Scotia.	9 10	4½	3
Cacheo River, Africa, W. Coast.	7 45	8		— Har., C. Breton Island.	7 48	6½	4½
Cadiz, Spain -	1 45	9½		Cantin Cape, Africa -	10 0	10	
Caen, France -	10 57			Canton River (entrance), China.	10 0	8	
Caermarthen (Bar) -	6 10	26	19½	Canton River } In Mar.	2 40	5½	
Caernarvon, Wales -	9 33	13½	10½	(Kuper Id.) }			
Caimites, St. Domingo -	8 0?	1?		— " } In May & June	1 40	5½	
Cairnlough, Ireland -	10 51	5½	5				
Cajeli Bay, Bouro -	1 0	6		Cape Coast Castle, Africa, W. Coast.	4 30	6	
Calais, France -	11 49	19½	15½	Cape May Landing, U.S.	8 19	6	5
Calbuco Beach, Patagonia, W. Coast.	1 15	16		Caracas River, Ecuador -	3 30	10	

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds, and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Caraquette Harbour, G. of St. Lawrence.	2 40	6	3	Catalina Harbour, Newfoundland.	7 0	6	4
Cardiff, (Penarth,) Wales	6 56	37½	29	Catharina Sta. L., Brazil -	2 45	6	4½
Cardigan, Wales -	7 1	12	9	Cato Bank, Australia, E.C.	8 0	6	
— Bay, Prince Edward Island.	8 40	5	3½	Catoche Cape, Yucatan -	9 30	1½	
Careening Bay, Australia, N. W. Coast.	11 45	30		Cattawade Bridge, Stour River, England.	1 8	4½	
Caremapu, Patagonia, W. Coast.	0 50	10		Cavalli Ids., New Zealand	8 0	7	
Cargados Carajos Shoals, Indian Ocean.	2 0	4		Cavern Id., China S., E.C.	9 30	5½	
Cargreen, R. Tamar, England.	5 47	14½	10½	Cawee Islands, Gulf St. Lawrence.	1 50	9	5
Caribou Harbour, Nova Scotia.	10 0	6	4	Cay West, United States	9 30	1½	1½
Carleton Point, Gulf St. Lawrence.	3 0	6	4	— N.W. Channel, U.S.	9 10	1½	1½
Carlingford (Bar or Cranfield Point), Ireland.	11 0	14	11	Cayenne, Guayana -	3 45	6-11	
Carlisle Port, England -	12 10	20	14	Cayeux, France - -	11 5	27½	21
Carlos, San, Port, Patagonia, W. Coast.	11 15	6		Ceara, Brazil - -	4 30	9	
— (Arenas Point) Patagonia W. Coast.	0 14	6		Cedar Cays, United States	0 51	3½	2½
— (English Bank) Patagonia W. Coast.	0 4			Cedeira, Spain, N. Coast	3 0	15	
Carlos, San, Port, Falkland Islands.	7 0	8		Centre Id., (Foveaux St.) New Zealand.	12 15	8	6
Carnot Bay, Australia, W. Coast.	0 30	13-14		Ceram, Wahaay Harbour, Moluccas.	6 0	3	
Carouge River, R. St. Lawrence.	7 15	16	11	Cerro Id., California -	9 10	7-9	
Carrigaholt, Ireland -	4 44	14	10½	Ceuta, Africa, N. Coast -	2 6	3½	
Carsaig, Scotland -	5 28	10	7½	Chacachacara Id., Trinidad, Caribbean Sea.	3 30	4	
Cartagena, New Granada	11 0	1½	1	Chacao Bay, Patagonia, W. Coast.	0 40	14	
Carteret, France -	6 25	31	22½	— Narrows, Patagonia, W. Coast.	1 15	16	
— Port, New Ireland.		6		Chacuarama B., Trinidad	4 20	4	2½
Carwar or Sedashigar Bay, Hindoostan, W. Coast.	10 0	6½	5	Chalky Inlet, New Zealand.	11 5	8	6
Cascumpeque H., Prince Edward Island.	5 40	3	2	Chalmers Port, America, N. W. Coast.	1 0	13½	
Cashla Bay, Ireland -	4 33	16	12	Chamé Bay, New Granada.	4 0	16	
Casquets, English Channel	6 45	15½		Chamisso Id., America, N. W. Coast.	4 42		
Castillos, Cape, Rio de la Plata.*	8 30	2		Champion Bay, Australia W. Coast.	9 10	1	
Castlereagh Cape, Tierra del Fuego.	2 50	4		Champlain R., St. Lawrence.	9 45	3	2
Castletown, Bearhaven, Ireland.	4 14	9½	7½	Changchi Id., China, E.C.	9 30	17	
— Isle of Man -	11 10	20	16	Changues Ids., Patagonia, W. Coast.	0 35		
Castletownsend, Ireland -	4 21	10½	8	Chapu Road, Hang-chu Bay, China, E. Coast.	12 0	25	
Castors Harbour, Newfoundland.	10 50	5?		Charles Cape, United States.	7 45	5	
Castries B., G. of Tartary	10 30	6		Charles Id., Galapagos -	2 10	6	
Castro, Patagonia, W. Cst.	0 11	18		Charleston, United States	7 26	6	5
Casuarina Point, China Sea, E. Coast.	9 30	6½		Charlowka R., Lapland	8 8	12	
				Chateau Bay, Labrador -	7 35	3½	1
				Chatham, England -	1 2	17½	14
				— Id., Galapagos	2 23	6½	
				— (Port Hutt), S. Pacific.	6 50	6	
				— Port, America, N. W. Coast.	1 0	12	

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Chatte Cape, United States	12 0	18	8	Clare I., Ireland -	4 38	12½	9½
Chanau Bay, China, E. Coast.	11 0	6½		Clarence Port, America, N.W. Coast	4 25		
Chausey, Isles de, France	6 9	35	26	----- Harbour, Long Island, Bahamas.	8 30	4	3½
Cheduba, Bay of Bengal- Chee-fow Harb., Yellow Sea, see Chifu.	11 30	8		----- River Heads, Australia, E. Coast.	9 0	6	4½
Chentaban River, China Sea, W. Coast.	10 0	5½		Clarke Harbour, Bay of Fundy.	8 40	9½	7
Chepo River, New Granada.	3 40	16		Clayoquot Sound, Vancouver Id.	12 0	12	
Chepstow, England -	7 30	38	28½	Clear, Cape, Ireland -	4 0	9	6½
Cherbaniani Reef, Laccadives, Indian Ocean.	10 0	7	4	Clearwater Point, Gulf St. Lawrence.	11 30	5	3
Cherbourg, France -	7 49	17	12½	Cleveland Bay, Australia, E. Coast.	7 30	10-12	
Chesilton, England -	6 13	10½	7	Cley, England, N.E. Cst.		5½	
Chester (Crane Wharf), England.	0 16	26		Clifden Bay, Ireland, W. Coast.	4 30	13½	10
Chester River (Rockhall Creek), United States.	5 23	2½	1	Clinch Fort, Fernandina, United States - }	7 53	6¾	6½
Chesterfield Islet, Australia, E. Coast.	8 30	5		Clonakilty, Bay, Ireland	10 30	11	8½
Chetican, C. Breton Id. -	8 15	3½		Coacocho Bay, G. of St. Lawrence.	4 30	5	3
Chichester, England -	11 30	14	11	Cobija Bay, Bolivia -	9 54	4	
Chifu, Yellow Sea -	10 34	8	6½	Cocagne River, G. St. Lawrence.	7 30?	4?	2?
Chimmo Bay, China, E. Coast.	10 20	16		Cochin Harb. and Road, Hindoostan, W. Coast.	1 30	2½	2
Chimney Id., Rees Pass, China, E. Coast.	11 30	12		Cockburn Island (Antarctic Ocean).	7 50	6	
Chinchu Harb., China, E. Coast.	12 25	17		----- Port, Africa, E. Coast.	4 15	12	
Chin-hae, Yung R., China, E. Coast.	11 20	12½		----- Australia, N. Coast.	5 45	24	
Ching-tan Bay, Yellow Sea	6 0	12	9	----- Sound, Australia, W. Coast.	9 0	1-1½	
Chipiona, Spain -	1 34	12½	8	Cockenzie, Firth of Forth, Scotland.	2 16	15¾	13
Chittagong (Bar), Bay of Bengal, E. Coast.	1 15	15	10	Cod Cape, United States	11 30	13	
Chodo Id., Korea, W. C.	6 20	12		Codroy Island, Newfoundland.	9 15	6	4
Choiseul Port, Madagascar, E. Coast.	4 0	5		Colorado River, La Plata	4 0	9	7½
Chosan Harb. or Tsauliang-hai, Japan Sea.	7 45	7	5	Colarados, R. La Plata -	3 40	11	
Christchurch, England -	{ 9 0 } 11 30	5		Cold Spring Inlet, United States.	7 32	5½	4½
Christiansted, Santa Cruz.	7 30	8		Coleraine, Ireland -	6 24	6½	4
Christmas Island, Indian Ocean.	10 0			Collier Bay, Australia, N.W. Coast.	11 45	36	
Christmas Harbour, Kerguelen Id.	2 0	2		Colne Point, Colne River, England.	12 0	14	10
Chuen-pee Point, Canton River.	2 0	7½		Colombilla Cay, Pearl Cays, Caribbean Sea.	2 0	2	
Chusan Archipelago, (Vernon Channel,) China, E. Coast.	9 40	14		Colombo, Ceylon -	1 0	2	
Chusan Tinghae, China, E. Coast.	11 0	12	9	Colonsay (Schallasaig) Scotland, W. Coast.	5 18	11	7½
Circular Head, Tasmania	11 40	9		Columbia River, (entr.) America, N.W. Coast.	0 15	7½	
Clam Point, B. of Fundy	8 27	8½	6½	Componce River, Africa, W. Coast.	10 0	15	11½
Clara Sta., L., Ecuador -	4 0	11					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Compu Inlet, Patagonia, W. Coast.	1 10	17	13½	Croc Harbour, Newfound- land.	6 30	4½	
Concarneau, France -	3 12	13	9½	Croisilles Harbour, New Zealand.	9 0	12	6
Condore, Cochin China -	3 0	4		Cromarty, Scotland -	11 56	14	11
Congo R., Africa W.C.	4 30	6		Cromer, England -	7 0	14½	11
Congoon Bay, Persian G.	7 45	9½		Crow Harb., Nova Scotia	8 0	6½	4½
Conil, Spain -	1 18	11½	7½	Crowdy Head, Australia, E. Coast.	9 15	5	3
Conquet Road, France -	3 46	21	15	Crooked Id., Bahamas -	7 0	2½	
Constitucion Cove, Bolivia	10 0	4		Crookhaven, Ireland -	4 9	9½	3
Conway Cape, Australia, E. Coast.	11 0	18		Cucac Bay, Patagonia, W. Coast.	12 0	6	
Cook Harb. Newfoundland	7 25			Cuckolds Point, River Thames, England.	1 45	19½	15½
Coondee, <i>see</i> Kúdi.				Culdaff Bay, Ireland, W. Coast.	5 53	8½	6
Cooper Port, New Zealand.	3 50	7½	5½	Culebra or Passage Id., Caribbean Sea.	9 0	1	
Copiapo, Chile -	8 30	5		Cullen Harbour, Fife Sound, B. Columbia.	12 0	16	11½
Coquet Rd., England, E.C.	3 0	14½	11	Cullin Id., Patagonia, W. Coast.		20	
Coquimbo Bay, Chile -	9 8	5		Culpepper Id., Galapagos	?	?	
Cordouan Lthse., France	3 37	13½	10½	Cumberland Basin, (Sack- ville) Bay of Fundy.	11 55	45½	38
Corentyn River, Guayana	5 10	8½	6	Cumsingmun Harbour, Canton River, China.	12 6	6½	
Coringa or Cocanada Bay, Bay of Bengal, W. C.	9 10	4-5	3	Cupchi Point, China, E. C.	8 0		
Coringa R. (Har), Bay of Bengal, W. Coast.	9 0	5		Cupica Bay, New Granada	3 30	13	
Corisco Bay (Elobey Isles), Africa, W. Cst.	5 0	7		Curieuse, Seychelles, In- dian Ocean.	5 10	7	
Cork (Penrose Quay), Ireland.	4 58	12½	10	Curtis Port, Australia, E. C.	9 40	10-12	
Corn Ids., B. of Honduras	1 45	2		Cuttyhunk, United States	7 40	4½	5½
Corner Inlet, S. Australia	11 40	8		Cutwell Harbour, New- foundland.	7 0?	2-4?	
Cornwall, Cape, England	4 35	18?	13?	Cuxhaven, Germany -	1 8	10	
Corpach (Loch Aber), Scotland.	5 59	11½		Cuyler Harb., California	9 25	5	4
Corran (Loch Aber), Scotland.	5 43	12	8½	Cypress Harbour, Sharp Passage, B. Columbia.	12 0	16	11½
—— Loch Linnhe, Scotland.	6 37	14½		Dagga Sound, New Zea- land.	11 30	8	6
Corunna, Spain -	3 0	15		Dahouet, France -	6 5	32	23½
Coudres Id. (Prairie Bay), R. St. Lawrence.	4 25	17	10	Dalawan Bay, China Sea, E. Coast.	11 0	5	
Courseulles, France -	9 7	20	15½	Dalcague, Patagonia, W. Coast.	0 26		
Courtmacsherry, Ireland	4 36	10½	8½	Dalhousie Harb., G. St. Lawrence.	3 10	9	
Coverack, England -	4 35	14½	11½	Dalkey Island, Ireland -	10 45	13	11
Cow Head Harbour, New- foundland.	10 41	8½	6½	Dalrymple B., Madagascar W. Coast.	5 0	15	
Cowes (West), England	{ 10 45 11 45 }	{ 12½ 12½ }	{ 9½ 9½ }	——— Prt., Tasmania	12 5	10	7½
Coy Inlet, Patagonia, E. C.	9 30	40		Dampier Strait, Moluccas		11	
Coyhuin River, Chile -	0 52	21		Danes Island, Spitzber- gen.	0 24	5½	
Cozumel, B. of Honduras	8 30	1½		Danger Point, Australia, E. Coast.	9 30	6	4½
Crane Island, River St. Lawrence.	5 24	17	13	Darnley Id., Torres Strait	9 30	12	
Cranford Bay, Mulroy Bay, Ireland.	8 3	4		Dartmouth, England -	6 16	14½	10½
Crapaud, Prince Edward Island.	10 0	8	6				
Crichton Harbour, Korea, S. Coast.	9 50	11½	8½				
Crimon Ids., Java Sea -	8 0	6	5				
Crinan, Scotland -	4 49	6½	5				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Darwin H., Choiseul Id., Falkland Islands.	6 30	5½		Dilhi or Dielli, Timor -	1 0	6	
Darwin Port, Australia, N. Coast.	5 30	17-24		Dillon Bay, Erromango Id., Banks Ids.	5 30	4	
Dauphin Fort, Madagascar	4 30	7		Dingle, Ireland -	3.51	10½	7½
De Roompot, North Sea	12 30	12	8	Discovery Port, America, N.W. Coast.	2 30	7	
Deal, England - -	11 15	16	12½	Dislocation Harb., Tierra del Fuego.	1 40	4	
Dealy Id., Melville Id. -	1 48	4		Diu Harb., Hindoostan, W. Coast.	11 0	6	4½
Deep Harbour, Fife Sound, B. Columbia.	12 0	16.	11½	Dives, France - -	9 39	21	16
— Point, Durian Strait	5 0	10		Divy Pt., Bay of Bengal		5	
Deer Harb., Newfoundland	7 49	3½	2	Doboy Lighthouse, U. S.	7 33	7½	7
— Sound, Orkneys -	10 30	10	7½	Dodandowe Bay, Ceylon	1 50	1½	
Delagoa Bay (Port Mel- ville), Africa, S. Coast.	4 30	15		Dodo R., Bight of Benin	4 17	5	
Delagoa Bay (Portu- guese Factory), Africa, S. Coast.	5 20	12		Domingo, San, Port, Pa- tagonia, W. Coast.	12 0	7	
— Shefeen Id.,	4 40	12		Donaghadee, Ireland -	11 13	11½	9
Africa, S. Coast.				Donegal Harb., Ireland -	5 18	11½	8½
Delaware (Breakwater), United States.	8 0	4½	3½	Doris Cove, Tierra del Fuego.	3 0	4	
Delftzyl, Germany -	11 15	8-10		Dornock Road, Scotland	11 47	11	
Delgado C., Africa, E. C.	4 0	16	11½	Douany, Comoro Ids.	4 0	11-12	
Demerara R., Guayana -	4 45	9	6	Douglas, Isle of Man -	11 12	20½	16
Denham Sound, Sharks Bay, Australia, N.W.C.	12 5	5		— Road, Bahamas -	8 30	4	2½
Denial Bay, Australia, S. Coast.	12 15	6		Dover, England -	11 12	18½	15
Denison Port, Australia, E. Coast.	9 30	6		Downham Reach, Orwell, England.	12 27	12	
Deoghur Harbour (en- trance). Hindoostan, W. Coast.	11 0	9	7	Dragons Mouths (Boca Grande), Caribbean S.	3 30	4	2½
Depuch Isle, Australia, W. Coast.	10 40	14		— (Boca	3 50	4	2½
Desire Port, Patagonia, E. Coast.	12 10	18½		Monos)P.			
Devarenne Strait, New Caledonia.		3½		Drakes Bay, California -	11 41	4½	3½
Devonport Dockyard, England.	5 43	15½	11½	Drayton Harb., St. Juan de Fuca Strait.	2 0	12	
Dhardur R. (entrance), Hindoostan, W. Coast.	4 30	27	20-22	Drogheda (Bar), Ireland	11 0	11½	9
Dheli River, Sumatra -	3 0	8		Duart, Isle of Mull -	5 0	12	10
Diamond Island, Bay of Bengal.	10 30	8		Dubba River, Hindoo- stan, W. Coast.	10 10	8	
— Point, Malacca Strait.	12 0	9½		Dublin (Bar), Ireland -	11 12	12-14	9-11
Diego, San, Bay, Cali- fornia.	9 38	5	3½	Dumbarton, Scotland -	0 20	9	
Diego, San, Cape, Tierra del Fuego.	4 30	10		Dunbar, Scotland -	2 8	14½	11
— Garcia Island, Indian Ocean.	1 30	6		Dunbeacon, Ireland -	3 51	10½	7½
— Ramirez Ids., Tierra del Fuego.	4 0	6		Duncan Bay, N.W. Coast of America.	12 0	21	
Dielette, France - -	6 40	27	20½	Duncansby Ness, Scot- land.	10 14	8½	6
Dieppe, France - -	11 6	27	20½	Dundalk, Ireland -	10 56	13½	11½
Digby Gut, B. of Fundy	11 0	27½	23	Dundee, Scotland -	2 32	14½	11½
				Dungeness, England -	10 45	21½	19
				Dunk Id., Australia, E.C.	9 28	6-10	
				Dunkerque, France -	12 8	16½	13½
				Dunkerron, Kenmare R., Ireland.	3 45	10½	8
				Dunmanus Harb., Ireland	3 57	9½	7½
				Dunmore, Ireland -	5 27	12½	9½
				Durnford Port, Africa, E. Coast.	4 45	12	
				Dusky Bay, New Zealand	11 15	10	8
				Dvina (Bar), White Sea		3½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Dyer Id., Africa, S. Cst.	2 50	5		Ertonau or Futuna, S. Pacific.	7 24	4	
Easdale Sound, Scotland	5 10	10-12		Escumenac, Pt., Gulf St. Lawrence.	4 10	4	2½
Easter Id., South Pacific	2 0			Esperanza Inlet, Vancouver Id.	12 0	12	
East Cape, New Zealand	8 55	7		Espirito Bay, Brazil -	3 0	4	
—Point, Prince Edward Island.	8 30	3½	2	Espirito Santo, C., Magellan Strait.	8 30	36-42	
—Alligator River, Australia, N. Coast.	8 15	15		Esquimalt, St. Juan de Fuca Strait.*	irr.	7-10	5-5
Eclipse Harbour, Labrador.		5		Essington Port, Australia, N. Coast.	3 24	13	
Ecrehous, France -	6 32	31	22½	Estevan, San, Port, Patagonia, W. Coast.	0 15	5	
Eddystone Pt., Australia, E. Coast.	9 39	7		Etches Port, America, N.W. Coast.	1 15	9½	
Eden Harbour, Patagonia, W. Coast.	12 30	5		Evangelists, Patagonia, W. Coast.	1 0	5	
Edgar Port Falkland Is.	7 15	6		Exmouth, England -	6 21	12½	8½
Edgartown, United States	12 16	2½	2	Exuma, Bahamas -	7 20	2½	
Edina, Africa, W. Coast	5 50	4		Eyemouth, Scotland -	2 15	15½	11½
Edmonstone, Id., Sherbro River, Africa.			8	Eyre Port, Australia S. C.	10 30	6	
Egg Id. Lt., United States	9 4	7	5½	Fair Isle, Shetlands -	11 0	5	3
— G. St. Lawrence	2 0	11	6	Fairy Port, Australia, S.C.		4	
Egmont Bay, Prince Edward Island.	3 0	4	2	Falkland Sound (N. entrance), Falkland Ids.	6 45		
— Port, Falkland Islands.	7 30	11		—(S. entrance)	7 0		
Eides Fiord, Færoe Ids.	11 0	9½	7½	Fall Harbour, Labrador -	6 40	3½	
Eigg Id., Scotland -	6 15	14	10	Falmouth, England -	4 57	16	12
Elbe, Entrance, Germany	12 0	11		False Point, Bay of Bengal, W. Coast.	8 0	8	
Elena Sta., Port, Patagonia, E. Coast.	4 0	17		Famine Port, Magellan Strait.	12 0	6	
— Bay, Ecuador -	1 18	8		Fane Id., Plumper Sound, Oregon.	irr.	12	
Elizabeth Bay, Africa, S.W. Coast.		5-6		Fannings Id., S. Pacific -		4	
Ellen Port, Islay -	5 0	5	4	Fanny Hole, Mulroy Bay, Ireland.	6 17	9½	5
Ellenwoods Anchorage, Bay of Fundy.	9 54	13	10½	Fansiak Channel, Canton R., China, E. Coast	1 0	7½	5
Elliot Port, Australia, S.C.		5-6		Farallon, South, California	10 37	4½	3½
Emden, Germany -	12 0			Fareham (close to the Upper Quay), England.	11 48	11½	6½
Ems River, (outer buoy), Germany.	10 0	8-10		— Bridge, England.	11 51	7½	4½
Encounter Rock, Yellow Sea.	10 44	11	8	Farewell, Cape, New Zealand.	9 20	14	10
Endeavour R., Australia, N. Coast.	8 0	5-10		Fatsizio, Japan Sea -	6 0	5	
— Strait, Australia N. Coast.	1 0	9½		Fayal, Azores, Atlantic Ocean.	11 45	4	
Endermo Harbour, Japan	5 30	6		Fear, Cape, River, United States.	7 19	5½	4½
English Bank, San Carlos, Patagonia, W. Coast.	0 4			Fécamp, France -	10 44	23½	18
English Harbour, Antigua		2		Fénérine, Madagascar -		3½	
English R., Delagoa Bay, Africa, S. Coast.	7 30	5		Fenit, Tralee Bay, Ireland	4 3	12½	9½
Enora Bay, Japan Sea -		4		Feolin Ferry, Jura -	4 41	6½	4½
Eran Bay, (Palawan) China Sea, E. Coast.	10 10	6½		Fernandina, Clinch Fort, United States.	7 53	6½	6½
Erebus Bay, Barrow Strt.	12 6	8		Fernando Noronha Island, S. Atlantic.	4 0	6	
Erme River, Bigbury Bay, England.	5 40	16½	11½				
Erqui, France -	5 59	33½	24½				

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Fernando Po, Bight of Biafra.	4 0	7		Foynes Island, Ireland -	5 35	15½	12
Ferole Cove, New, Newfoundland.	10 50	5?		France, Port de, or Noumea Bay, N. Caledonia.	8 25	4	
— Harb., Old, "	9 28	4½-6½		Francis, St., Bay, Tierra del Fuego.	4 0		
Ferribly Sluice, River Humber.	6 41	20½		— Cape St., Africa, S. Coast.	8 34	5	
Ferro, Canary Ids. -	12 30?	9?		Francisco, San (North Beach), California.	12 6	4½	3½
Ferrol, Spain -	3 0	15		Fraser River (entrance), British Columbia.	6 30	7-10	
Ferry Side, South Wales	5 49	23	16½	Fraserburgh, Scotland -	0 40	11	8½
Filey Bay, England -	4 20	16	12½	Frechette Id., River St. Lawrence.	8 0	14	9
Finisterre, Cape, Spain -	3 0			Frederick Reef, Australia, E. Coast.	8 0	6	
Fish Hd., G. Manan, Bay of Fundy.	11 16	22½	18½	Frederickshaab, Greenland.	6 3	12½	9½
Fishguard, Wales -	6 56	11½	8½	Freycinet Estuary -	4 15	3½	
Fitz-Roy Id., Australia, E. Coast.	9 15	7-12		— Reach, Sharks Bay, Australia N.W. Coast.	3 0	5	
Fitzroy Port, Falkland I.	4 45	6		Friederichstadt, Denmark	2 37	9	
Flamand Bay, St. Domingo	irr.	2-3?		Frio Porto, Brazil -	2 40	4½	
Lamborough Hd., England	4 30	16	12	Froward Cape, Magellan Strait.	1 0		
Flamenco Port, Chile -	9 10	5		Fugloe Fiord, Faroe Ids.	11 15	6½	4½
Flatholm Ids., Bristol Channel.	6 54	37?	28?	Funchal Bay, Madeira -	12 48	7	
Fleetwood Port, England	11 12	26½	19½	Funk Id., Newfoundland	7 0?	2-3?	
— Wyre Light -	11 11	27	20½	Fury Cove, Patagonia, W.C.	1 15		
Flesh Bay, or Bay St. Bras, Africa, S. Coast.	3 30?	6?		— Harbour, Tierra del Fuego.	2 30	4	
Fleur de lis Harb., Newfoundland.	7 15	2-4		Fury Id., Tierra del Fuego	2 30	4	
Flinders Group, Australia, E. Coast.	9 15	8-12		Fury and Hecla Strait, Arctic Regions.	7 0	8	
Florida Cape, United States.	8 36	1½	1½	Gaboon R., Africa, W.C.	5 30	3	
Flushing, Belgium -	1 20	15		Gallant Port, Magellan Str.	9 0	5½	
Fog Ids., Hang-chu B., China, E. Coast.	11 45	17		Galle, Pointe de, Ceylon, S. Coast.	2 0	2	
Fogo Id., Newfoundland	7 20	4		Gallegos Port, Patagonia, E. Coast.	8 50	46	
Folkstone, England -	11 7	20	16½	Gallinas R., Africa, W. C.	6 45	4	
Folly Point, Petitcoudiac River, B. of Fundy.	11 49	45	38	Galloway (Mull of) -	11 15	15?	12?
Fongwhang Group (Bullock Harb.) China W.C.	8 30	17		Galong Bay, Hainan Id., China Sea.		4-5	
Forçados River, Bight of Benin.	4 22	5		Galveston, G. of Mexico		1½	¾
Fore carreeh R., Africa, W.C.	7 40	11		Galway, Ireland -	4 35	14½	11
Formby Point, England -	10 35	28		Gambia R., Africa, W.C.	8 10	6-9	
Formosa Mt., Malacca St.	6 0	11	8½	Gambier Ids., Australia, S. Coast.	1 50	3	
Fort Dauphin, St. Domingo	7 0	5½	3½	Garliestown, Scotland, W. Coast.		17	12
Fortune Bay, Patagonia, W. Coast.	0 50	7		Garroch Head -	11 49	10	
Forward Harb., British Columbia.	3 0	16	11½	Gaspé Basin, Gulf St. Lawrence.	2 40	5	3
Foulness, Crouch River, England.	12 5	14½	10½	Gay Head, United States	7 37	7	
Fowey, England -	5 14	15	11½	Geby, Fohou Id., Gilolo Passage, Moluccas.		5	
Fowlers B., Australia, S.C.	10 30	6		Geelong Harbour, Australia, S. Coast.	2 30	3½	2½
Fox Bay, Falkland Ids. -	7 0	6		George Cape, Nova Scotia	9 15	4	2
Foyle Lough (Warrenpoint), Ireland.	6 20	6½	5				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
George d'Elmina, St. Africa, W. Coast.	4 30	6		Goods Bay, Patagonia, W. Coast.	0 30	7	
—— Port, B. of Fundy	11 17	32	28	Good News, B. America, N. W. Coast.	6 15	13½	
—— St., Basin, Australia, N. W. Coast.	12 20	24-37		Good Success Bay, Tierra del Fuego.	4 3	6-8	
—— Shoals, United States.	10 30	7		Goold Island, Australia, E. Coast.	6 45	6	
—— St., Harb., Newfoundland.	10 3	6½	4½	Goole, River Humber, England.	7 26	13	
Georges Bay, Tasmania	9 42	3	2	Gooria Creek (entrance), Hindoostan, W. Coast.	11 0	8½	
Georges, St., Sound, G. of Mexico, middle entrance.	1 31	1½	1½	Goose Cove, Newfoundland.	7 0?	2-3?	
—— west entrance	irr.	2½-4		Gorda Sound, Virgin Islands.	8 30	1½	
Georgetown, United States	8 40	4½	3½	Gore Port, New Zealand	9 0	8	6
—— South Island, United States.	7 56	4½	3½	Gorée, Africa, W. Coast	7 45	2½	
Geriah or Viziadroog, Hindoostan, W. Coast.	11 0	9	7	Goree Road, Tierra del Fuego.	4 0	8	
Germain St., France -	6 20	34	25	Goulburn Ids., Australia, N. Coast.	6 0		
Ghubbet Ne, Sokotra, Indian Ocean.	7 0	7		Goury, France - -	7 6	22	17.
—— Gollonsir, Sokotra, Indian Ocean.	7 20	8		Gowlland Harbour, Discovery Passage, Vancouver Id.	5 30	11	
—— Hashish, Arabia, S.E. Coast.	10 0	10		Gracias, Cape, Harbour, Bay of Honduras.	10 30	2	
Gibraltar (old Mole), Spain.	2 20	3½		Grand Cestos, Africa, W. Coast.	5 20	4	
Gigha Sound, Scotland -	2 22	4	2½	—— Harb., Gd. Manan, Bay of Fundy.	11 7	21	17.
Gijon Bay, Spain, N. Cst.	3 0	14	11	Grand Lahou, Africa, W. Coast.	4 20	4	
Gilmorris Id., Africa, W. Coast.	6 0	11		Grand Passage, B. of Fundy.	10 43	20½	17
Gizri River, Hindoostan, W. Coast.	9 45	10		Grand Port, Mauritius -	1 0	1½	
Glasgow, Scotland - -	1 25	9	7½	—— Rustico, Prince Edward Island.	6 40	4	2
—— Port, Scotland -	0 18	9		Grande-digue, Madame I., Cape Breton Id.	7 55	6½	4½
Glenan Iles, France -	3 12	13	10	Grande Point, Chile -	9 45	5	
Gloucester Cape, Tierra del Fuego.	1 30	5		Granton Pier, Scotland -	2 20	16	13½
—— Harbour, United States.	11 4	10½	8½	Granville, France -	6 18	37	27½
Gluckstadt, Germany -	3 9	10		Gravelines, France -	12 0	19	15
Goa Bay, Hindoostan, W. Coast.	10 30	7	5½	Graves Port, Howe Sound, Gulf of Georgia,* British Columbia.	noon	12	
Goapnath Point, Hindoostan, W.C.	2 25	18	13½	Gravesend, England -	1 10	17½	14
Godbout River, Gulf St. Lawrence.	1 52	11	6	Great Barrier, Id. (Nagle Cove), New Zealand.	6 25	10	7
Goeree Island (West Gat) North Sea.	1 45	7		Great Barrier Reef, Australia, E. Coast.	8 48	7	
Gogah, Hindoostan, W. Coast.	3 50	27-30	21	Great Fish Bay, Africa, W. Coast.	2 30	5-6?	
Golovnin Bay, America, N. W. Coast.	6 23	3½		Great St. Lawrence Harb., Newfoundland.	8 30	7	4
Gomera, Canary Ids. -	12 45?	9?		Greatman Bay, Ireland	4 39	15½	11.
Gometra, Loch Tuadh, I. of Mull.	5 29	11½	8	Green Island, River, St. Lawrence.	2 45	16	9.
Gonaives Bay, St. Domingo	8 0	1					
Good Bay, Newfoundland.	10 40	7½	5½				

* From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Greencastle Point, Ireland.	11 2	14	11½	Halifax, Nova Scotia -	7 49	6	5
Greenock, Scotland -	12 8	9½	8½	Halt Bay, Patagonia, W. Coast.	0 30	8	
Greenwich, England -	1 43	19	15	Hamburg, Germany -	5 29	6½	
Gregory Bay, Magellan Strait.	9 45	23		Hamilton Port (Korea), Yellow Sea.	8 30	11	
Port, Australia, W. Coast.	11 30	3		Hammelin Pool, Sharks Bay, Australia, N.W. Coast.	5 0	3½	
Grenada (St. George Harb.), Caribbee Ids.	2 40	1½	¾	Hammerfest, Norway -	1 10	9	
Grenadines, Caribbee Ids.	3 0	1½	1	Hammond Knoll, England, E. Coast.	7 40		
Grey Port, Swan River, Australia, W. Coast.	9 0	1-1½		Han-kau, China, W. Coast		33-38	
Greytown, Mosquito Cst.	9 0	1½		Hang-chu Bay (Seshan Ids.), China, E. Coast.	11 45	14	
Gribanika Pt. White Sea	4 50	3		———— (Fog Ids.) -	11 45	17	
Griffin Bay, Haro Archipelago.	irr.	12		———— (Chapoo Rd.)	12 0	25	
Griffith I., Barrow Strait	12 15	3½	2½	———— off Can-pu -		32	
Guiguet Bays, Newfoundland.	7 0?	2-3?		Hanover Bay, Australia, N.W. Coast.	11 30	24-38	
Grimby, England -	5 36	19½	15	———— Sound, Bahamas	8 15	4	3
Grindstone Island, Bay of Fundy.	11 47	41	34½	Hanstul (mouth), Gulf of Kutch, Hindoostan.	2 0		
Grimex Cape, France -	11 27	21½	16½	Harbour of Mercy, Magellan Strait.	1 22	4	
Groendine, R. St. Lawrence	9 0	9	6	Harbour Grace, Newfoundland.	7 30?	7?	
Guinard Island, W.C. of Scotland.	6 37	14½		Harbour Id., Nova Scotia	7 40	6½	4½
Gumbacho Bay, Peru -	6 30	2		Hardy Port, New Zealand	9 55	8	6
Gurdafui Cape, Africa, E. Coast.	6 15	6		Haro Strait (Channels leading to, from St. Juan de Fuca Strait).	irr.	10-12	
Gurmei Bay, Peru -	6 10	2		Harrington Port, England	11 5	26	19
Guatulco, Mexico, W. C.	1 30	5		Hartlepool, England -	3 28	15	11½
Guayaquil, Ecuador -	7 0	11		Harvey Prt. (Call Creek), Vancouver Id.	0 30	10	
Guaymas, Mexico, W. C.	8 0	4		Harwich, England -	12 6	11½	9½
Guernsey, (St. Peter Port,) English Channel.	6 37	26	18½	Hastings, England ..	10 53	24	17½
Gua Narrows, Patagonia, W. Coast.	2 10			———— Harbour, Bay of Bengal, E. Coast.	10 40	13½	
Guanches Kay, Bahamas	7 40	3		Hatiling Bay, Moluccas -	6 0	3-4	
Guana Cay, Bahamas -	8 30	3		Hatteras Inlet, United S.	7 4	2½	2
Guadavi R. (entrance), Hindoostan, W. Coast.	2 0	19	15½	Haute Isle, Bay of Fundy	11 21	33	28½
Guilest Sand, England -	11 40	12	8	Havana, Cuba -	8 14	3	
Guilaff Id., China, E. C.	11 30	15		Havannah Harb., Sandwich Id., Banks Ids.	7 15	4	
Gysborough, Nova Scotia.	8 20	6½	4½	Haverfordwest, Wales -	6 42	7½	2½
Heodore (Bunbeg), Ireland.	5 32	11	8	Hâvre, France -	9 51	22	18
Harlem, Netherlands -	9 0			Hawke B., New Zealand	7 50	3	
Hatfield Id., Lapland -	7 9	9		Hearts Content, Newfoundland.	7 30	4	2½
Habitants Harb., C. Breton, Id.	8 20	6½	4½	Héaux Lights, France -	5 45	31	23½
Haci Cape, St. Domingo	6 0	3		Heawandou Pholo Atoll, Maldives.	9 30	5	
Hain-tan, (Thornton Haven), Yellow Sea.	9 30	12	8	Heda Bay, Japan Sea -		5½	
Hanri River, Hindoostan, W. Coast.	9 40	8		Helena St., Bay, Africa, W. Coast.	2 30		
Hayt Head, Nova Scotia.	1 30	4		———— Id., S. Atlantic	3 11	3	
Hedadi Harb., Yezo Island, Japan.	5 0	3		———— St. Sound, U.S.	7 8	7½	6
				Helford, England -	4 43	15½	11½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Helgoland, German Ocean	11 33	9½	7	Holy Island, England -	2 30	15	11
Helier, St., Jersey, English Channel.	6 36	31½	23	Holyhead, Wales -	10 11	16	12
Hell Gate Approaches, United States.				Hon-cohe Bay, China Sea, W. Coast.	11 30	5	
—— Long Id., (Blackwells Dock).	9 59	6	5½	Hondeklip Bay, Africa, S.W. Coast.	2 30	5½	
—— N. of Astoria Ferry.	9 48	6½	5½	Honfleur, France -	9 29	23½	18
—— Pot Cove, (S.E. part).	10 48	8½	6½	Honghai B., China, E. C.	10 0	6½	
—— Wards Id., (Paupers Dock).	10 9	6½	5	Honoruru, Sandwich Ids.	4 0	2	
Hellevoetsluis, Netherlands.	2 30	8	6	Hongkong, China, E. C.	10 15	4½	
Henlopen Cape, United States.	8 0	4½		Hoogly R., (W. entrance), Bay of Bengal, W.C.	10 0	10½	
Henry Cape, United States	7 40	4		—— Kedgerree to Diamond Harbour.		18*	
Henry Port, Patagonia, W. Coast.	12 0	5		Hooper Id., Korea, S.C.	9 10	11½	8
Hernando Id., Strait of Georgia, B. Columbia.	6 0	12-14		Hope Harb., Falkland Ids.	8 10	7	
Hermite Isle, Australia, W. Coast.	10 0	14		—— Sound (Mia-u-tau Group), Yellow Sea.	10 24	6½	
Heron Islet, Capricorn Group, Australia, E. C.	9 0	10		Horn Cape, Tierra del Fuego.	4 40	9	
Herradura Port, Chile -	9 8	5		Horn or Blaavand Point, Jutland.	1 44	5	
—— Nicoya Gulf -	3 9	10		Horton Bluff, B. of Fundy	12 30	48	40
Hesquiat Harbour, Vancouver Id.	12 0	12		Hougue La, France -	8 42	18½	14½
Hewett Bay, Tierra del Fuego.	0 30	6½		Hourdel, France -	11 26	27½	21
Heybridge, Blackwater, River, England.	12 20	12	8	Hout B., Africa, W. Cst.	2 20	5	
Hie-chechin Bay, China, E. Coast.	7 0			Houtman Rocks, Australia, W. Coast.	11 30	2½	
Hicks Bay, New Zealand	9 0	7		Howden, R. Tyne, England.		12	
Hierling, Jutland -	2 45	5		Howe, West Cape, Australia, S. Coast.	9 0	6	
Higbees, Cape May, United States.	8 33	6½	5½	Howth Harbour, Ireland	11 9	13	12
Hillsborough R., Charlottetown, Prince Edward Id.	10 45	9½	8	Huacho Bay, Peru -	4 45	3	
—— (Head of R.)	11 0	10	7	Huafu Islands, Patagonia, W. Coast.	12 0	7	
—— Island (New Port), Bonin Islands.	11 32	8½		Huapilinao Hd., Patagonia, W. Coast.	1 25	15½	
Hillswick Firth, Shetland	9 45	6½	5	Huasco Port, Chile -	8 30	6	
Hilton Head, United States	7 19	7½	6½	Hui-ling-san, China, S.C.	8 15	7½	
Hiogo Bay, Japan Sea -	7 15	5½	4½	Huildad Inlet, Patagonia, W. Coast.	0 48	16-20	
Hirtshals, Jutland -	4 28	1		Hu-i-tau Bay, China, E. Coast.	12 15	16	
Hobarton, Tasmania -	8 15	4½	3½	Hull, England - -	6 29	20½	
Hoe-e-tow Bay, China, E. Coast.	2 15	16		—— Bridge, Crouch R., England.	12 25	16	
Hokianga R. (entrance), New Zealand.	9 45	10		Hulu Shan B., Yellow Sea	2 30	8	
Hokianga R. (Kokohu) New Zealand.	10 15	10	7	Humboldt Bay, California	12 2	5½	
Hollesley, England -	11 30	8?	6?	Hunter Id., Bass Strait -	11 30	8	
Holmes Hole, U. States -	11 43	1½	1½	Hunter Port, Australia, E. Coast.	9 45	6-7	
Holsteinborg, Greenland	6 30	10		Hurst (Camber), England	{ 10 0 } { 12 0 }	{ 7½ }	
				Husum, Denmark -	2 36	9	
				Hyannis, United States -	12 22	4	
				Icacos Point, Trinidad -	4 14	7	
				Ichabo Id., Africa, W. C.	1 0	6	
				Iengen, New Caledonia -	6 15	4½	
				Ilfracombe, England -	5 42	27½	

* In March and April.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Iki, Japan Sea - -		8		Jerba, Mediterranean -	3 10	7	5
Ilha Grande, Brazil -	12 30	5	4	Jericoacoara, Brazil -	11 30	12	9
Ilheo, Port d', Africa, W. Coast.	3 0	8-10		Jersey (St. Helier), English Channel.	6 36	31½	23
Iliolo Port, Filipinas -	12 0	5½		— (Rosel) -	6 15	30	21½
Inagua, Bahamas -	8 0	3½	2½	Jervis Bay, Australia, E. Coast.	6 20	6-9	
Indefatigable Id., Galapagos.	1 56	6		Jezirat Arabi, Persian G.	6 30?		
Independencia Bay, Peru	4 50	4		— Hamar-al-nafur,	9 30	10	
Indian Cay, Florida -	8 23	2½	1¾	— Arabia, S.E. Coast.			
Indus (Gizree Bunder), Hindoostan, W. Coast.	9 50	7		— Jün Persian Gulf	11 30	10	
Inhambane R., Africa, E.C.	4 15	10		— Kabr " -		8½	
Inishbofin, Ireland -	4 34	12½	9½	— Kais " -	0 45	7½	
Inishkeel, Ireland -	5 10	11	8	— Kharg or Káreg " -	8 0	6½	
Inishturk, Ireland -	4 36	12½	9½	— Larek " -	10 15		
Inkanskie, White Sea -	9 15	14		— Tumb " -		8	
Inman Cape, Tierra del Fuego.	2 0	4		Jiddah, Red Sea - -		3	
Intsi Point, White Sea -	11 55	16		Jijginsk Id., White Sea	5 15	4	
Inverary, Scotland -	12 0	10		Joao San, Brazil -	6 24	14	10½
Inverness, Scotland -	12 18	12	9½	Johanna Id., (anchorage)	3 40	11	
Investigator Rd., Australia, N. Coast.	8 0	9		— Pomony Harb., Comoro Ids.	4 0	11	9
Iona Sound, Scotland -	5 11	11½	8½	John St., Bay of Fundy -	11 21	27	23
Ipswich, England -	12 35	13½		— Newfoundland - (East Coast).	7 30	6	4
— United States -	11 26	10½	8½	— (North Coast) -	10 40	7½	5½
Iquiqui Road, Peru -	8 45	5		— River, Africa, S.C.	4 0	5	
Ireland Id., Bermudas -	7 4	4		— River, U. S. -	7 28	5½	5
Isidro St., Cape, Magellan Strait	1 0	8		Jones Harb., Newfoundland.	7 49	3½	2
Island Harbour, Choiseul Id., Falkland Islands.	5 20	6		Jonquiere Bay, Gulf of Tartary.	10 0	6	
— Country Harbour, Nova Scotia.	7 40	6½	5½	Joombas R., Africa, W.C.	8 10	6	
Islay, Peru - -	8 53	7		Josef, San, Port, Patagonia, E. Coast.	10 0	30	25
Isle-aux-Condres, R. St. Lawrence.	4 25	17	10	Jourimain Island, New Brunswick.	9 30	6	3
Isles de Los, Africa, W. C.	6 35	13		Juan de Nova, Madagascar		5	
Isolette Cape, Arabia, S.E. Coast	9 0	10		Juan Fernandez I., Chile	9 30	4	
Ives, St., England -	4 44	21	15	Juan San, Porto Rico -	8 2	1½	
Jacinto, Port San, Ticao Id. Filipinas.	6 30	6		— San Port, Peru -	5 10	3	
Jackson Port (N. Head), Australia.	8 15			Juby Cape, Africa -		8	
Jacmel, St. Domingo -	irr.	2-3?		Judith Point, United States	7 32	3¾	3½
Jafrabad, Hindoostan, W. Coast.	11 35	9	7	Juggee, Seer R., Hindoostan, W. Coast.	1 30	6	
James Id. (Adam Cove), Galapagos.	2 14	5		Jukan Ids., Lapland -	9 0	13	
— N. side, Galapagos.	2 34	5		Julian, San, Port, Patagonia, E. Coast.	10 45	30	
James Id., W. end, Galapagos.	3 10	5		Julianshaab, Greenland -	5 6	7	5
James R. (City Point) U.S.	2 11	3	2¾	Julien, St., Harbour, { Newfoundland	7 21 A.M. 6 30 P.M.	4½	3
Jashk Shoal, Persian Gulf	9 30	8		Junk Fleet entrance, Canton River, China.	11 50	6½	
Jask Cape, Persian Gulf	6 0	6		Junk River, Africa, W. C.	5 45	5	
Jebogue, Bay of Fundy -	10 4	15	11¾	Junkseylon Id. (E. Side), Malacca Strait.	10 0	11½	
Jedore, Nova Scotia -	7 45	6½	4½	Jura Island, (Small Isles), Scotland.	5 3	3½	2½
Jekatarina Ids., Lapland	6 23	10		— Feolin Ferry " -	4 41	6½	4½
				Juria, Hindoostan, W.C.	2 0	16	13

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Kaikora Penin, New Zealand.	5 30	8	6	Killala Bay, Ireland -	5 22	10½	8
Kaipara Harb. (entrance), New Zealand.	10 55	10	8	Killeany Bay, Arran Ids., Ireland.	4 28	13½	10
Kalang Bayang Harb., Java		2		Killingholme (Humber R.), England.	6 2	19½	15½
Kalgalaksha, White Sea	6 50	7		Killybegs, Ireland -	5 16	11½	8½
Kalian Point, Banka Strait	8 17*	12½		Killyleagh, Ireland -	12 40	11	9½
Kandalaksha, White Sea	3 25	7		Kilmichael Point, Ireland	8 30	4½	3
Kanushin Cape, White Sea	11 54	15		Kilrush, Ireland -	4 42	14	10½
Kapiti Island, New Zealand	9 0	6		Kincardine, Firth of	2 53	17½	15
Karachi Harb. (entrance)	10 30	9½	6	Forth, Scotland.			
Hindoostan, W. Coast.				King Id., Bass Strait -	1 0		
Karakoa Bay, Owyhee -	3 49			King Port, Falkland Ids.	7 30	5	
Kari or Lukput River,	11 15	10½		— Sound, Australia,	0 10	33	
entrance, Hindoostan,				W. Coast.			
W. Coast.	12 15	12		— George Sound, Aus-	11 56	1-4	
				tralia, S. Coast.			
Lukput, Hindoostan,				Kingsbridge, England -	5 46	10	
W. Coast.	11 15	10½		Kingstown, Ireland -	11 10	11	5½
				Kinsale, Ireland -	4 43	11½	9
Kotasir, Hindoostan,				Kinsiang Point, China, E.	7 0		
W. Coast.				Coast.			
Kata, Japan Sea - -	6 4	6½		Kircubbin, Ireland -	12 42	11½	9½
Katwyk, Netherlands -	2 30	5	7	Kirindi, Ceylon - -	3 30		
Kawau Id., New Zealand	6 30	10		Kirkcudbright, Scotland	11 10	23	
Kawhia Harb., New Zealand.	9 30	12		Kirkwall, Orkneys -	10 9	10	7½
Keats Port, Australia,	6 0	22		Kishm, see Kesm.			
N. Coast.				Kiswara Harb., Africa,	4 30	12	
Kediwari R., Hindoostan	9 57	7		E. Coast.			
Keelacarry, Ceylon -	11 0			Kitnapatnam, Bay of	11 0	1½	
Kedgerree, Bay of Bengal	11 30			Bengal, W. Coast.			
Keeling Islands (Port	5 30	5		Kiu-kiang, China, W. C.		24	
Refuge), Indian Ocean.				Klaskino Inlet - -	12 0	12	
Kegashka B., G. St. Lawrence.	10 45	5	3	Klaskish Inlet, Vancouver Id.	12 0	12	
Kelung Harb. (Formosa),	10 30	3		Knox Bay, Vancouver Id.	12 0	16	
China Sea, E. Coast.				Knysna Harb., Africa, S.C.	3 30	6½	
Kenmare R. (W. Cove),	3 52	10	7½	Koelwatte Bay, Moluccas		7	
Ireland.				Koepang, Timor - -	11 0	9	6½
Kenn Reef, Australia, E.	8 0	5½		Kokohu, New Zealand -	10 15	10	7
Coast.				Ko-kun-to Group, Korea,	2 25	18	10
Kennebec River (Hanniwells Point), U.S.	11 15	9½	7	W. Coast.			
Kent Island, Bass Strait	11 10			Kok-si-kon Prt. (Formosa)	11 30	3	
Kentish Knock, England	11 47			China Sea, E. Coast.			
Keppel B., Australia, E.C.	9 30	9-14		Koombanah B., Australia,	9 0	½-3	
Keret, White Sea -	3 8	6		W. Coast.			
— Point, White Sea	4 30	5½		Kouloi River - -	1 15	20	
Kerguelen Island, Indian Ocean.	2 0	2		Kou Zomen, White Sea -	3 30	6	
Kesm, Persian Gulf -	11 0	12		Kovda Bay, White Sea -	3 25	6	
Kettle Cove, United States	7 48	5	4½	Koweyt, Persian Gulf -	0 15	9	
Khór Jerameh, Arabia,	9 30	10		Kowie River, Africa, S.	4 0	4-5	
S.E. Coast.				Coast.			
Kijouk Phyou Harbour,	10 0	9	6	Krakatoa, Strait of Sunda	7 0	4	
Bay of Bengal.				Kúdi River, Hindoostan,	9 50	10	
Kilbaha, Ireland -	4 16	13	9½	W. Coast.			
Kilda, St., Hebrides -	5 30			Kuper Harb., Korea, S.C.	9 28	11½	5½
Kildin Id., Lapland -	6 45	12		— Port, America, N.W.	1 40	13	10½
Kilkieran Cove, Ireland -	4 34	15½	11	Coast.			
				Kuriyán Muriyán Bay	8 20	6½	
				and Islands, Arabia,			
				S.E. Coast.			

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Kurrachee, see Karáchi.				Lawrence, Great St., Harb.	8 30	7	4
Kutch, Gulf of, (mouth), Hindoostan.	11 30			Newfoundland.			
Kweshan Ids., China, E. Coast.	9 30	14		Le Have Cape, Nova Scotia.	7 48	7	5½
Kyau-chau Bay, Yellow Sea.	5 0	12	9	— Nova Scotia, Crooked Channel.	7 51	7½	6
Kyam River, White Sea	5 23	4		— Mothers Island	7 51	7	5½
Kykduin, Netherlands -	7 0	12		— Getsons Cove	7 55	7½	6
Kyle Akin, Loch Alsh, Scotland.	6 16	15½	11	— Bridgewater (McKean's Wharf.)	8 6	8	6½
Kyle Rhea, Scotland -	6 0	15	11	— Lunenburg (Spidlers Cove.)	7 54	7½	6
Kynquot Sound, Vancou- ver Id.	12 0	12		Le Maire Strait, Tierra del Fuego.	4 0	7	
La Poile Bay, New- foundland.	9 0	6	4	Leervig Fiord, Færøe Ids.	0 30	6½	4½
Labuan Island, Victoria Harbour, Borneo.	9 45	6		Leith, Scotland - -	2 17	16½	12½
Labyrinth Ids., Magel- lan Strait.	0 30	5½		Leman Shoal, England, E. Coast.	6 0		
Lacul Harb., St. Domingo	6 0?	3?		Lennox Cove, Tierra del Fuega.	4 40	8	
Lady Bay, Australia, S.C.		4		Leopold Port, Barrow Strt.	12 6	6	4½
Lady Elliot Islet, Aus- tralia, E. Coast.	9 0	7-8		Lepreau, Bay of Fundy -	11 18	24½	21
Lagos, Portugal -	2 7	13		Lerwick, Shetland -	10 30	6	4
— River (Bar), Bight of Benin.	6 0	8		L'Etang Harb., Bay of Fundy.	11 19	23½	20
Lagos River (Consulate Wharf.)		2		Leubu River, Chile -	10 30	5	
— (Palaver Ids.)		1		Leven Port, Madagascar	3 30	7½	
Laguimanoc Port, Luzon	1 30	5½		Levrier B., Africa, W.C.	12 0	6-7	
Laguna de Terminos, G. of Mexico.	noon.	1½		Lewis Cape, St. Labrador	6 30		
Lakadivh Group, Hindoo- stan, W. Coast.	10 30	6	4½	Liant Cape (G. of Siam), China Sea, W. Coast.	5 7	6½	
Lamalin, Newfoundland	9 15	8½		Liau Ho (Bar), Yellow Sea.	4 0	11½	7½
Lambayeque Rd., Peru -	4 0	3		— (entrance) -	5 0	12	
Lamlash, Scotland -	11 49	10	7	Liau-tung, Chingho, Yellow Sea.	1 20	6½	
Lamo Harb., Africa, E. Coast.	4 6	11		— Gulf (Sand Point), Yellow Sea.	4 50	7	5½
Lancaster, England -	11 16	8½		— N.W. Head of Gulf.	5 30	10	8½
Landshipping, Cleddau River, Wales.	6 27	20	14½	Limbé Strait, Moluccas -		5	
Langshan Crossing, Yang- tse-Kiang.*	1 40	12	8	Limerick, Ireland -	6 16	18½	13½
Lankeet Island, Canton River, China.	11 20	6½		Lindy River (entrance), Africa, E. Coast.	4 15	12	
Lansew Bay, China, E.C.	10 0	13		Língéh, Persian Gulf -	12 0?		
Lanzarote, Canary Ids. -	1 0?	9?		Lintin Island, Canton R. China, E. Coast.	12 0	7½	
Laredo B, Magellan Strt.	11 30	9		Lisbon (Belem), Portugal	2 30	12	9
Largs, Scotland -	11 50	10		Liscanor Bay, Ireland -	4 23	13½	10
Latham Id., Africa, E. Cst.	4 0	10		Liscomb Harb., Nova Scotia.	8 0	6½	4½
Latitude Bay, Tierra del Fuego.	2 5	4		Lishan Bay, China, E. C.	10 15	16	
Lau-mu ho, Yellow Sea -	1 30	5		Lissa, Adriatic - -	4 10	2½	
Laun, Great and Little, Newfoundland.	8 15	7	4	List, Denmark - -	2 21	6	
Laura Harb., Tierra del Fuego.	1 0	6		Litau Bay, Yellow Sea -	3 0	6	4
Lavata Bay, Chile -	9 20	5		Litke Ridge, White Sea -	11 45	15	
				Little Egg Harbour, } United States - }	7 10	4½	3½
				Little Fish Bay, Africa, W. Coast.	2 30	5-6?	

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Little Gull Island, U. S. -	9 38	3	2½	Loch Ryan (Head of Loch)	11 12	11	
Littlehampton, England	11 36	16	11½	— Skipport „ -	5 52	12½	9
Little Metia, G. St. Lawrence.	2 10	13	8	— Strivan „ -	11 55	6	
Little Milford Quay,	6 31	19	13½	— Sunart „ -	5 40	13½	
River Cleddau, Wales.				— Tarbert, West, Harris Island, Scotland.	6 4	11½	8½
Little Natashquan, G. St. Lawrence.	11 0	5	3	— — East „ „	6 10	13½	10
— Port, Newfoundland.	10 42	5½		— — West, Argyleshire, Scotland.	2 30	1-4	
Little Tancock Island, Nova Scotia.	7 43	7½	6	— — East „ „	11 53	9	
Liverpool, England -	11 23	26	20½	— Tongue „ -	7 53	15	12
— Bay, Nova Scotia.	7 50	8	5	— Torridon „ -	6 20	15	11
— R., Australia -	6 30	12		— Tuadh „ -	5 29	11½	8
Liza Bay, Lapland -	5 58	9		Lofoten Ids., Norway -	12 0	9	7½
Lizard Id., Australia, E.C.	9 15	7-10		Loheia, Red Sea -	1 30	3	
Lizard Point, (Perran Vose Cove), England.	5 0	14½	10½	Loire R. (St. Nazaire), France.	3 40	15½	11
Llanelly (Bar), Wales -	6 16	28	21	Lomas Point, Peru -	8 19	5	
Lloyd Port, Bonin Ids. -	6 8	3		Lombock, (Ampanam B.), Java Sea.	8 0	6	
Loanda, San Paul de, Africa, W. Coast.	4 30	5		London Bridge, England	2 7	19½	16½
Loango B., Africa, W.C.		6½		— Docks, England	1 57	19½	17
Lobah Point, Banka Strt.*	11 0†	10		Londonderry, Ireland -	8 1	7½	5½
Lobito B., Africa, S.W. Coast.	2 20	5		Looe (East), England -	5 26	16	13
Lobo Point, Peru -	8 0			Lookout Point, United S.	0 58	2	1½
Lobos Cay, Bahamas -	7 40	3		Lopez Cape, Africa -	4 30	4-6?	
Lobos Head, Patagonia, W. Coast.	0 29			L'Orient (Port Louis), France.	3 11	13	9½
Loch Aline, Scotland -	5 33	13½	10½	Lord Howe Island, S. Pacific.	8 30	6	
— Alsh „ -	6 16	15½	11	Lo-shan-kau, Yellow Sea	4 30	11	9
— Boisdale „ -	5 47	12½	9½	Lough Larne, Ireland -	10 48	6½	6½
— Broom „ -	6 40	14½	10½	— Rossmore, Ireland	5 20	11	8
— Carron „ -	6 29	16½	11½	Louis Port, France -	3 11	13	9½
— Cuan „ -	5 36	13	9½	— Mauritius -	12 30	3	2½
— Duich „ -	6 0	15½	11	Louis, St., Bay, St. Domingo.	irr.	2-3?	
— Dunvegan „ -	6 7	15½	11	Louisburg Harb., Cape Breton Id.	8 0	5	4
— Eil (Head of Loch)	6 27			Low Bay, Falkland Ids.	5 0	5½	
— Eport „ -	6 6	12½	9½	— Port, Patagonia, W. Coast.	0 40	7	
— Eriboll „ -	7 43	14½	11	Lowestoft, England -	9 57	6½	3½
— Erisort „ -	6 43	15½	11½	Luabo River (entrance), Africa, E. Coast.		22	
— Etive, Stonefield „	7 3			Lucas San, Bay, California	9 20	9½	
— — Bunawe „	7 54	5½		Lucipara Pass, Banka Strait.	irr.	10	7½
— Ewe „ -	6 39	14½	10½	Luis, St., Texas, G. of Mexico.		1½	
— Fleet „ -	0 22	10½		Luis Obispo, San, California	10 8	4½	3½
— Goil „ -	12 6	10	6	Lunaire Bay, Newfoundland.	7 0?	2-3?	
— Harport -	5 54	13½	10	Lundy Island, England -	5 15	27	20
— Hourn „ -	5 45	13½	10½	Lung-mun Harbour, Yellow Sea.	10 0	7	
— Inver „ -	6 40	14	11	Lyme Regis, England -	6 21	11½	5½
— Laxford „ -	6 44	15	11½	Lymington, England -	{ 10 25 }	8	6
— Leven (Head of Loch)	6 28			Lynn Deep, England -	{ 12 15 }	23	
— Linnhe „ -	5 26	12½	8½		6 0		
— Long „ -	12 6	12					
— Maddy „ -	6 6	12½	9½				
— Moidart „ -	5 44	13½	9½				
— Nevis „ -	5 47	14½	10				
— Roag „ -	6 11	11	8				

* In S.E. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Lynn Harbour, England		18		Malaga, Spain - -	12 0	3	
— Road " -		20		Malabide Inlet, Ireland -	11 15	10	8
Lyttelton Port, New Zealand.	3 50	7½	5½	Malcolm Atoll, Maldives	10 30	3	
Mabou River, C. Breton Id.	9 0	4		Maldon, Chelmer River, England.	12 32	10	6
Macabé, Brazil - -	2 30	9½		Malé, Maldives - -	12 30	3	
Macao, China, E. Coast -	10 0	6½		Malludu Bay, Borneo -	10 30	6-8	
Macassar, Celebes -	4 40	5½		Malo, St., France -	6 5	35	26
McDougall Harb., Africa, S.W. Coast.	2 30	5½		Malpelo Point, Peru -	4 0	10	
Maceio, Brazil - -	4 30	8½		Man-of-War Cay, Bahamas.	8 10	4	
Machias, Seal Id., Bay of Fundy.	11 5	18	14½	Mana Island, New Zealand	7 0	8	6
Macowa, Red Sea -	0 30	2		Manama, Persian Gulf -	5 20	7	
Macquarie Harbour, Tasmania.	7 30	3		Manawatu River, New Zealand.	10 0	8	6
— Port, Australia, E. Coast.	8 56	4-5		Mancenilla Bay, St. Domingo.	7 0	4-5	
Macquereau P., G. St. Lawrence.	2 0	5	3	Mandwa Creek, Hindoostan, W. Coast.	10 45	7	5
Madame Id., Madagascar	4 0	5		Mangalore, Hindoostan, W. Coast.	11 0	7	5½
Madoc Port, Wales -	7 30	17		Manganitoe Bay, Moluccas.	5 0		
Madras Road, Coromandel Coast.	7 34	3½		Mangarol Bunder, Hindoostan, W. Coast.	10 30	7	5
Magadoxa, Africa, E. Cst.	4 30	8		Manicouagon River, R. St. Lawrence.	2 15	12	7
Magdalen Ids., G. St. Lawrence.	8 20	3	2	Manila (Luzon Island), China Sea, E. Coast.	10 40	2½	
— River, R. St. Lawrence.	11 0			Manna, Navigators Ids. -		6	
Magdalena Sta., Island, Magellan Strait.	12 0	10		Manning River, Australia, E. Coast.	9 15	4	
Magdalene B., California	7 35	6½		Manorah R., Hindoostan, W. Coast.	1 30	16	
Mahato Id., Africa, E.C.	4 30	7		Manta Port, Ecuador -	3 4	6	
Mahneah R., Africa, W.C.	7 40	11		Manukan Har. (entrance), New Zealand.	9 30	13	10
Mahone Bay, Nova Scotia	8 0	7		Manybranch Harb., Falkland Ids.	7 40	7½	
— Heckmans Anchorage.	7 45	7½	6	Maple Bay, Vancouver Id.		12	
— Princes Inlet	7 42	7½	6	Maplin Light (Thames), England.	12 5	14½	10½
— Ham Island	7 47	7½	6	Maquereau Point, G. of St. Lawrence.	2 0	5	3
— Martins R. -	7 43	7½	6½	Maranham, Brazil -	7 0	16½	10½
— Chester -	7 44	7	5½	Marblehead, United States	11 30	12	
Mabons R., United States	9 52	7	5½	March Harb., Tierra del Fuego.	3 10	6	
Maiden Rocks, Ireland, N.E. Coast.	10 43	6½	6½	Marcouf, St., France -	9 55	20	
Majambo B., Madagascar	4 30	16		Mare Harb., Falkland Ids.	6 0	6	
Makátein, Arabia, S.E. Coast.	9 0	6		Margarets, St., Bay (Shut-in Island) Nova Scotia.	7 47	7½	6
Makalleh, Arabia, S.E. Coast.	8 30	7		— Newfoundland	9 28	4½-6½	
Makongai Id., Fijii Ids. -	6 0	4	3	Margate, England -	11 40	15½	13
Makumba R., Madagascar	4 45	17		Maria Cape, Saghalin Id., Sea of Okhotsk.	2 0	5	
Makung Harb., Pescadres, China Sea.	10 30	9½	7	Maria Sta., Id., Chile -	10 20	6	
Malabrigo Port, Peru -	5 0	2		Maria Van Diemen Cape, New Zealand.	8 0	7	
Malacca Strait (light vessel, one fathom bank).	6 0	15	12				
— (off Mount Formosa).	8 0	11	8½				
— Road, Malacca St.	7 30	11	8½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Maristow, River Tavy, England.	5 47	8½	4½	Mellish Reef (Sand Cay), Australia, E. Coast.	7 55	5-6	
Marjoribanks Harbour, Korea, W. C.	3 30	29		Mellon, Ireland -	6 1	18½	13½
Mark, St., Bay of, St. Domingo.	8 0?	1?		Melo Port, Patagonia, E. C.	3 40	15	
Marka or Muerka, Africa, E. Coast.	4 30	8		Memory Rock, Bahamas.	7 50	3	
Marks, St., United States	1 14	3	2½	Menadou B., C. Breton Id.	8 15	5½	
Maroni Bay, Comoro Ids.	4 53	10		Menam River, (Paknam), China Sea, W. Coast.	5 7	9½	
—— River, Guayana	5 30	8	6	Menemsha Bight, U.S. -	7 45	4	2½
Martaban, Bay of Bengal	2 20	21		Mensular Id., S.E. end, Sumatra.	6 0	4	
Martin, St., Cove, Tierra del Fuego.	3 30			Merbát, Arabia, S.E. Cst.	9 0	6¾	
—— C. Horn Ids., Tierra del Fuego.	3 50	8		Mercy Bay, Banks Land		2	
Martin, St., de la Arena, Spain, N. Coast.	3 30	15		Mercury Bay, New Zealand.	7 21	7	3
Martin Vas Rocks, South Atlantic.	3 45			Mergui, Bay of Bengal, E. Coast.	10 30	18	
Martinique, Robert Harb. Carribean Sea.		4-5		Merigomish, Nova Scotia	10 6	5½	3½
Mary, Cape St., Newfoundland.	8 30	7	5	Merville, France -	9 36	21	17½
Mary St. Harb., Madagascar, E. Coast.	4 0	5		Metway Port, Nova Scotia	7 50	8	5
—— Newfoundland -	7 40	7½	5	Mevagizey, England -	5 4	15½	12
Mary Port St., I. of Man	11 10	20	16	Mexillones Port, Bolivia	10 32	3	
—— St., Scilly Is. -	4 18	15¾	11¾	Mezen, White Sea -	1 48	15-22	
Maryport, England -	11 3	18	13	M'hul Dwarka, Hindoostan, W. Coast.	10 30	7	
Mascat, Persian Gulf -	11 15	6		Miau-tau, (Depôt Bay), Yellow Sea.	10 35	6	
Mason B., New Zealand	11 10	8	6	Miaveness, Færoe Islands	3 12	6½	4½
Massacre Bay (Tasman corner), New Zealand.	8 45	13	9	Michael, St., Azores -	12 30	6	
Massacre Bay, Motu Pipi River, New Zealand.	9 50	14	10	Michael Seymour Port, Gulf of Tartary.	5 30	3	
Massowah, Red Sea -	1 0	3		Middle Cove, Tierra del Fuego.	3 30		
Matacumbe Bay, Lower United States.	8 23	2½	1¾	Middle Id., Patagonia, W. C.	12 0		
Matan River, G. St. Lawrence.	2 15	11	7	Middlesbrough, R. Tees, England.	3 55	13	10½
Matuku, Fijii Ids. -	6 18	5	3	Middleton R., Bight of Benin.	4 15	5	
Maule River, Chile -	10 0	5?		—— Reef, South Pacific.	8 30	6	
Maulmain, Bay of Bengal,	2 0	22	17	Milford Haven (St. Ann Lighthouse), Wales.	5 56	24	13
Mauritius (Port Louis) -	12 30	3	2½	Milford Sound, New Zealand, Mid. Island.	9 15	8	6
—— (Grand Port) -	1 0	1½		Millman Island, Palawan, W. Coast.	10 27	2½	
May Cape, United States	8 19	6	5	Millport, Cumbrae Island, Scotland.	11 50	10	6
Mayday Bay, Palawan -	9 55	3½		Min R. (Temple Point), China, E. Coast.	10 45	19	14½
Mayhé Id., Indian Ocean	4 0	6½		Min R. (Losing Island), China, E. Coast.	12 0		
Mayotta Id., Mozambique	4 10	11¾		Mindanao, S. Point Filipinas.	7 0	6	
Mayumba, Africa, S.W.C.		7		Minehead, England -	6 30	35	26½
Mazambo Port, Madagascar.	4 30	15		Mingan Harbour, Gulf St. Lawrence.	1 16	6	4
Mazatlan, Mexico, W. Cst.	9 40	7		Mingan Id., G. St. Lawrence	1 30	6	4
Mboli Harbour, Florida Id., Solomon Ids.	5 30	6		Minimegash, Prince Edward Island.	3 30	5	3
Meichen Sound, China, E. C.	12 30	17					
Melbourne, Australia, S. C.	2 48						
Melinda P., Africa, E. C.	4 15	11					
Mellacoree R., Africa, W. Coast.	7 40	11					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Minow Islands, Madagascar, W. Coast.	5 0	15		Mouton Port, Nova Scotia	7 54	7½	5¾
Minquiers Rocks, France	6 6	35	26	Moville, Ireland - -	7 6	7½	5½
Miramichi (Bar), Gulf St. Lawrence.	5 30	5	3	Mowah Bunder, Hindoo- stan, W. Coast.	1 0	12	9½
Mira-por-voa, Bahamas -	9 30	3	2¼	Mozambique Har., Africa, E. Coast.	4 15	12	
Mirs Bay (Tide Cove), China, E. Coast.	10 0	6½		Mucaras Reef, Bahamas	7 40	3	
Miscou, G. of St. Law- rence.	2 30	5	3	Muerka, see Marka.			
Mississippi, S. W. Pass, Gulf of Mexico.		1½		Mugeres Harb., Bay of Honduras.	9 30	1½	
Mistanoque, Labrador -	10 30	6	3	Mull of Cantyre, Scotland	10 35	4	
Mistley Quay, Stour R., England.	0 48	11½		Mulroy Bay (Bar), Ireland	5 40	11½	8
Moala, Fijii Islands -	5 50	5		Mumbles Lt. House, Wales	6 1	27½	20½
Mobile, Gulf of Mexico	irr.	1-2		Mungalaum Id., China	11 0	5	
Mocha Island, Chile -	10 30			Sea, E. Coast.			
Mocha Road, Red Sea, (E. Coast).	12 0	4½		Mungullo or Mongallo R., Africa, E. Coast.	4 45	12	
Mogador, Africa, W. Cst.	1 18	10-12		Murdounah Id. (E. Cst.), Red Sea.	6 0	3	
Molynaux Bay, New Zea- land.	3 0	8	6	Murray Islands, Torres Strait.	9 30	10	
Mombaza Port, Africa, E. Coast.	4 0	11		Murray Pass, Bass Strait	11 10	8	
Monach Ids., Scotland, W. Coast.	5 44	12½	8½	Musa Port, Babuyan Ids.		5	
Monckton (Railway), Bay of Fundy.	0 15	47	37½	Mutlah River, (entrance to Biddah River), Bay of Bengal, W. Coast.	10 0	14	
Mondego (Bar), Portugal	2 30	7		Mutlah (Muda Kali), Bay of Bengal, West Coast.	11 45	15	
Monganui Harb., New Zealand.	8 15	9	7	Mutton Island, Ireland, W. Coast.	4 20	13¾	9½
Monomoy, United States	11 30	5½	4	Myggenæs Fiord, Færoe Islands.	9 0	9½	7½
Monrovia, Africa, W. C.	6 0	6		Na Vatu Reef, S. Pacific	6 8	4	
Montauk Pt., United States.	8 20	2½	2	Naafe R., Bay of Bengal, E. Coast.	10 0		
Monterey, California -	10 22	4½	3¾	Naalsøe Fiord, Færoe Islands.	4 0	6½	4½
Montgomery Isles, Aus- tralia, W. Coast.	12 0	36		Nafa-Kiang, Loo Choo Islands.	6 28	7	
Montrose, Scotland -	1 25	13	10	Nagasaki Bay, Japan Sea.	7 15	9	7½
Monts, Point de, Gulf St. Lawrence.	12 0	12	6	Nagore, Bay of Bengal, W. Coast.	8 15		
Moreno (Constitucion Road), Peru.	10 0	4		Nairai Id., Fijii Ids. -	5 53	4½	3½
Moreton Bay, Australia, E. Coast.	9 30	3-7		Namki Ids., China, East Coast.	8 30	17	
Morewellham, R. Tamar, England.	6 12	10½	6½	Namo Harbour, China Sea, W. Coast.	10 0	7½	
Morjovets Id., White Sea	11 20	17		Namoa Island (Clipper Road), China, E. Coast.	11 15	7	
Morlaix Road, France -	4 53	24	18	Namquan Harb., China, E. Coast.	10 0	17	
Morro (Sandy Pt.), Ecuador.	5 0	11		Nanaimo Harb., Gulf of Georgia, Vancouver Id.	5 0	14	
Mossel B., Africa, S. Cst.	3 30	6		Nancowry Harb., Nicobar Islands.	9 15	8½	
Moudinga Id., White Sea	5 50	3½		Nandi Passage and Bay, S. Pacific.	6 35	4½	
Mount Desert Island, United States.	11 10	13		Nangamessie Harbour, Sumba.	11 30	17	18½
— Louis Bay, R. St. Lawrence.	11 0	6-8	4				
Mourondava, Madagascar, W. Coast.,	4 45	12					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Nangka Id., Banks Strait		12		New Ross, Ireland	6 4	12½	10
Nanoose Harbour, Van- couver Id.	5 0	11		— Year Sound, Tierra del Fuego.	3 30		
Nantucket, United States	12 24	3½	■	— York, United States	8 13	5½	4½
Napoleon Road, Gulf of Tartary.	2 30	2½		Newburyport, United States	11 23	9	7½
Narrinda Bay, Mada- gascar, W. Coast.	4 30	15		Newcastle, Australia, E. Coast.	9 45	6-7	
Narrows (First), Magellan Strait.	9 0	36-42		— England	4 23	10½	
— (Second), Ma- gellan Strait.	10 0	23		— Ireland	11 4	14½	12
Naruto (Fukura) Japan Sea.	6 17	7		Newhaven, England	11 51	20	15
Nash Point, Bristol Channel.	6 25	33	25	Newport, United States	7 45	4½	4
Nasparte Inlet, Vancon- ver Id.	12 0	12		— Wales, (South Coast.)	7 10	39	29
Nassau, New Providence, Bahamas.	7 30	4	3	— (W. C.)	7 0	12	9
Nassau Bay, Tierra del Fuego.	4 0	6		New Quay, Wales	7 30	15	
Natal Port, Africa, S. C.	4 30	6		Newton Stewart, Scot- land, W. Coast.*	12 0	12	6
Naturaliste Channel, Sharks Bay, Australia, N.W. Coast.	11 45	6		Nhatrang Bay, China, W. Coast.	8 30	5½	
Navallo Port, France	3 42	13	9½	Nicholas, St., Harb., G. St. Lawrence.	1 55	11	7
Nazaire, St., France	3 40	15½	11	— Port, Peru	5 15	3	
Naze, The, England	12 6	12½	10	Nicholson Port (Lambton Harbour) New Zealand.	4 30	5	3
Nee-ah Harbour, Oregon	12 33	7½	6½	Nicobar Id. (Nancowry Harb.), Indian Ocean.	9 15	8½	
Needles Point, England	9 46	7½	5	Nicolas, St., Bay, Ma- gellan Strait.	2 6		
Negapatam, B. of Bengal	5 0	3		Nicoya Gulf (Port Her- radura), Cent. America.	3 9	10	
Negro Harbour, Nova Scotia.	8 12	7	5½	Nieuport, Belgium	12 18	16	13
Negro River, Patagonia	11 0	14		Nieuwediep, Netherlands	7 27	4	3½
Nelson, New Zealand	9 50	14	10	Niger River (Nun en- trance), Africa, W. Coast.	4 8	6	
— Port, Australia, N.W. Coast.	12 0	17		Nikolskoi Chan., White Sea.	5 25	3	
Nempkish River, Van- couver Island.	0 30	14		— Twr., White Sea	6 0	2	
Nerbudda River (Broach Point, Hindoostan, W. Coast.	3 40	25		Nimrod Sound, China, E. Coast.	10 30	20	
Neuf Port, Gulf St. Lawrence.	2 10	11	8	Ninepin Group, China E. Coast.	10 0	5	
—, River St. Lawrence.	8 30	14	9	Ning-hai, Yellow Sea	12 0	6	
Neville Port, Vancouver Id.	0 30	17		Nin-po-fu, Yung River, China E. Coast.	1 0	9	
New Bedford (entrance), United States.	7 57	4½	4	Nisqually, America, N.W. Coast.	6 0	18	15
— Castle, United States	11 53	7	6½	Noamh Island, Scotland	5 2	11½	7
— Haven, United States	11 16	6½	5½	Noel Bay, Bay of Fundy	12 41	50½	43½
— London, United States.	9 28	3	2½	Noir Island, Tierra del Fuego.	2 30	5	
		1		Noirmontier, France	3 2	16	11½
		1	2½	Nolloth Port, Africa, S.W. Coast.	2 30	5½	
		1½	7½	Nootka Sound, Vancou- ver, Id.	12 0	12	
		1	6	Norderney, Germany	10 30	8	
				Nore, England	12 30	15½	13
				Norfolk Island, S. Pacific	7 45	7	
				North Balabac Strait, China, E. Coast.	10 50	5	

* At Carty Quay.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
North Cape, C. Breton Id.	8 0	4		Oonting Port, Loo Choo Islands.	6 35	8	
— Edisto River, United States.	7 10	7	5½	Oösaka R. (entr), Japan	7 30	5½	4½
North Harbour, Newfoundland.	8 0	7½	5	— City "	8 17	2½	½
— Sands, Malacca Strait.	5 30	15	12	Oösima, Japan Sea -	6 50	5	
Nosari Khari (Bar), Hindoostan, W. Coast.	8 0	18		Oporto, Portugal -	2 30	10	
Noss Island, Madagascar	5 0	15		Orange B., T. del Fuego	3 30	5	
Noumea Bay, New Caledonia.	8 25	4		— Cape, Magellan Strt.	3 0		
Nova Zembla Harbour, Lapland.	6 36	10		Orete, <i>see</i> New River.			
Nowanugga, Hindoostan, W. Coast.	1 45	18	14	Orford Haven (Bar), England.	11 30	7½	
Nuchatlitz Inlet, Vancouver Id.	12 0	12		— Port, California -	11 26	6½	4½
Nuevo Gulf, Patagonia, E. Coast.	7 0	10		— Quay, England -	12 30	7½	
— Port, Central America.	3 10	12		Orfordness, England -	11 15	8	6½
Nukulan Port, Fijii Ids.	6 47	5½		Orinoco River (entr.) Guayana.	6 0	3	
Numa-choa, Comoro Ids.	3 0	14		Orleans Id., R. St. Lawrence.	5 40	17	13
Nunez River, Africa -	10 0	15	11½	Ormond, Kenmare River, Ireland.	3 43	10	7½
Nyminde Gab, Jutland -	2 41	2		Ornsay, I. of Skye -	5 50	14½	10½
Nysna or Knysna Harb., Africa, S. Coast.	3 30	6-7		Orlov Letni C., White S.	5 18	4	
Oban, Scotland -	5 22	12	9½	Os Ilheos, Brazil -	4 30		
Obb of Harris, Isle of Harris, Scotland.	6 16	11½	8½	Osaki, Japan Sea -	5 55	6½	
Observatory Id., China Sea, E. Coast.	11 0	5½		Oscuro Cove, Patagonia, W. Coast.	0 55	20	
Oeracocke Inlet, United States.	7 4	2½	2	Osprey Reef, Australia, E. Coast.	8 36	6	
Octavia Bay, New Granada.	3 30	13		Ostend, Belgium -	12 25	19	15
Oelar Cape, Banka Strait	6 30	12		Otago Har., New Zealand	2 50	7	5
Oho Sima, Loo Choo Ids.	7 30	5½		Otaheite, South Pacific -	noon	1½	
Oibo Harb., Africa, E.C.	4 15	6		Otterswick, Orkneys -	9 13	11	8
Olaveaga, Bilbao River, Spain.	3 15	12		Otway Port Patagonia, W. Coast.	11 37	6	
Old Pt., Comfort, United States.	8 17	3	2½	Ou ou Kinsh Inlet, Vancouver Id.	12 0	12	
Old Providence, Bay of Honduras.	irr.	1		Ounalashka Id., America, N.W. Coast.	7 30	7½	
Olenji Islands, Lapland -	7 30	12		Ouro R., Africa, W. Cst.	12 0	8-9	
Oleron, Ile d', France -	3 50	19		Ower Shoal, England, East Coast.	6 30		
Omaider Island (Gulf of Akabah), Red Sea.	6 0	4		Oxbaasheia, Svee Fiord, Norway.	12 0	8	
Omersari R., Hindoostan, W. Coast.	1 45	18		Oyster Bay, United States	11 7	9½	8
Omonville, France -	7 29	15½	12½	Oystreham, France -	9 38	21	16
'Om-rasas-Masirah, Arabia, S.E. Coast.	10 0	10		Packsaddle Bay, Tierra del Fuego.	3 30	6	
One Fathom Bank Light, Malacca Strait.	6 0	15	12	Padstow, England -	5 13	20½	16½
Onega River, White Sea	9 17	6-7		Pagham (entrance), England.	11 30	16½	12½
Ono Ids., Fijii Ids. -	6 0	4		Pago Pago, Navigators Ids., S. Pacific.			4½
Oolooogan Bay, China Sea, E. Coast.	9 30	5½		Paimpol, France -	6 0	31	23½
				Palais, Port le, Belle Ile, France.	3 18	14½	10½
				Palliser Cape, New Zealand	6 0	6	
				Palm Isles, Australia, E.C.		8-10	
				Palma, Canary Ids. -	12 30?	9?	
				Palmas Cape, Africa, W.C.	4 30	4	
				Palmedo Road, Sumba Id.		15	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Palmeira Point, Ceylon -	9 30	7-11		Pelican Lagoon, Kangaroo Id., Australia.	5 0	6	
Paluan Bay, Mindoro -		5		Pelorus Sound, New Zealand.	9 35	11	7
Pamarung Ids., Borneo, E. Coast.		8-10		Pemba Channel, Mozambique.	4 0	11	
Pampang Bay, Java -		7-8		—— Id., Mozambique	4 15	12	
Panama Road, Central America.	3 23	15-22	10-16	Pembroke Dockyard, Wales.	6 12	21	15½
Pancol, China Sea, E.C.	9 40	6		Penang, Malacca Strait -	12 0	9	7½
Pansand Hole, England -	12 0	15½	13	Peñas Cape, Tierra del Fuego.	6 2	12	
Paposo, Chile -	9 40	5		Pender Harb., Strait of Georgia, B. Columbia.†	6 0	13	
Paquique Cape, Bolivia -	9 45			Peniche, Portugal -	1 54		
Para, Brazil, N. Coast -	12 0	11		Penmark Rocks, France	3 16		
Parahiba, Brazil -	5 0	9-12		Pennington R., Bight of Benin.	4 15	5	
Parenga-renga Harbour, New Zealand.	7 54	7		Pensacola, G. of Mexico		1½	
Parida Id., New Granada	3 15	10½		Pentillie, R. Tamar, England.	5 55	13½	2½
Parsboro, Bay of Fundy	12 17	43	37½	Pentland Firth, Stroma, S. Side.	9 47	7½	6
Pasado Cape, Ecuador -	3 30	10		—— Swona, E. Side	10 24		
Pasages Port, Spain -	3 0	12	9	—— W. Side	9 35		
Passage or Culebra P., Caribbean Sea.	9 0	1		—— Great Skerry, E. Side.	11 4	7½	6½
—— Id., Banda Sea -	noon	6		—— W. Side	10 53		
Passandava Bay, Madagascar, W. Coast.	5 0	15		Penzance, England -	4 30	16½	12½
Patapsco R. (Bodkin Pt.) United States.	5 42	1½	1	Percy Isles, Middle or No. 1 Id.	10 30	16	13
Paterson Port, Australia, N. Coast.	4 0	16-24		—— South or No. 2 Islet, Australia, E. Coast.	10 30	14	
Patersons Inlet, New Zealand.	1 10	5	6	Perim Id., G. of Aden -	12 0	7	
Patrick Port, Scotland -	11 10	15	12	Pernambuco, Braz'l -	4 45	8-6	
Patta B., Africa, E. Cst.	4 30	10		Peros Banhos, Indian Ocean.	1 30	5	
Patteson Port, Vanu Lava Id., Banks Ids.	6 40	5		Perouse, La, Strait, Japan Sea.	10 30	6	
Patuxent R., U. States -	1 16	2	1½	Perron Cape, Sharks Bay, Australia, N.W. Coast.	12 45	5½	
Patytan Bay, Java -	3 0	7		Perth, Scotland -	3 35		
Paul de Loanda, San, Africa, S.W. Coast.	4 30	5		Perula B., Mexico, W.C.		7	
Paul St. Id., Indian Ocean	11 0	3		Pescadore Ids. (Makung Harb.), China Sea.	10 30	9½	7
—— G. St. Lawrence	8 0	5	3	Peter, St., Bay, C. Breton Island.	7 30	6	4
Paumben Pass, Bay of Bengal, W. Coast.	1 30	2		—— Harb., Prince Edward Island.	8 30	4	5½
Payta Port, Peru -	3 20	3		Peterhead, Scotland -	0 34	10½	8½
Pearce Point, Australia, N. Coast.	6 55	20	26	Petit Passage, B. of Fundy	10 41	22	15
Peckett Har., Magln. Strt.	12 0	6		Petit Port, B. of Islands, Newfoundland.	10 42	5½	
Pedro Gonzales, New Granada, (Trapichi Id.)	3 50	16		Petrel Bay, St. Francis Isle, Australia, S. Coast.	12 0	6	
Pedro, San, Pass, Patagonia, W. Coast.	0 30	9		Petucura Rock, Patagonia, W. Coast.	0 50	16	
—— San, Anchorage, California.	9 45	4½	3½	Pheasant Point, Wusung River, China, E. C.	0 35	13	8
Peejow, see Pidioe.				Philadelphia, U. States -	1 18	6½	7½
Peel, Isle of Man -	11 8	16½	13				
Pegasus Port, New Zealand	11 50	8	6				
Peh-tang-ho, Yellow Sea	3 33	10	7½				
Pei-ho or Peking River (entrance), Yellow Sea.*	3 40	10	7½				
—— (Tien-tsin)	7 0	4½					
Pelew Islands, N. Pacific		6					

* Time and rise much affected by winds.

† From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Philip B., E. side, Magellan Strait.	9 30	24		Plumper Sound (Fane Id.), Vancouver Id.	irr.	12	
Philip Port, Australia, S. Coast. } Lonsdale Point }	9 42	7	5½	Plymouth Breakwater, England.	5 37	15½	11½
Queens Cliff	10 50	3	2	—— (Sutton Pool)	5 32	15½	11½
Nepean Point	10 53	2½	1½	—— United States	11 19	11½	10½
Dromana	2 19	3	2½	—— New, New Zealand.	9 30	12	9
Schnapper Pt.	2 14	2½	2	Pomba B. Africa, E. Cst.	4 0	15	11
Bellarine Jetty	2 21	2½	2	Pomquet, Nova Scotia -	9 15	4	2½
Harvey Point	2 39	3	2½	Ponga River, Africa, W. Coast.	7 30	12	9½
Geelong -	2 30	3½	2½	Poolbeg Lt. Hse., Ireland	11 12	12-14	9-11
Williamstown	2 31	2½	2	Poole, England - -	{ 9 10 } 12 45	{ 6½ } 14½	{ 4½ } 10½
Melbourne -	2 48			Poolewe, Loch Ewe, Scotland.	6 39	14½	10½
Piankatank R. (Cherry Point), United States.	10 5	2	¾	Pootoo Island, China, E. Coast.	8 15	12	
Pichidanque Bay, Chile -	9 20	5		Poqueldon Harb., Patagonia, W. Coast.	0 54	18	
Pictou Har., Nova Scotia	10 0	6	4	Portaferry, Ireland -	12 0	18-21	12-16
Pidioe or Peejow Bay, Lombeck.		10-12		Port-au-Choix, Newfoundland.	10 47	5	
Piel Harbour, England -	11 5	28	21	Port au Prince, Saint Domingo.	8 0?	1?	
Pierre, St., Newfoundland	8 33	6½	4½	Port-en-Bessin, France -	8 57	20	15½
—— Island, China Sea, F. Coast.		4		Port Royal, Jamaica -	11 0	1	
Pigeon Bay, Yellow Sea	11 45	8		—— Sound, U.S.:			
Pihkishan Ids., China, E.C.	8 30	17		Entrance - - -	7 16	7½	6½
Pillar C., Magellan Strt.	1 0			Beaufort - - -	7 26	3½	2½
—— Cape, Tasmania -	1 0	6		Portchester, England -	11 46	13½	10½
Pillars, R. St. Lawrence	5 0	17	10	Portendik, Africa, W. C.	10 0	6	
Pimlea Harb., Africa, E. Coast.	4 30	12		Porthcawl, Wales -	6 8	28½	21½
Pinas Bay, New Granada	3 15	14		Porth-dyn-lleyn, Wales	8 30	16	
Pinmill, Orwell River, England.	12 20	12		Portishead, England -	7 16	41½	31
Pio Quinto Port, Babuyan Islands.	6 0	6		Portland Inlet (Salmon Cove) America, N.W. Coast.	1 8	16	
Pirie Port, Spencer Gulf, Australia, S. Coast.	7 15	9-11		—— United States	11 25	10	7½
Pisco Bay, Peru -	4 50	4		—— Bay, Australia, S. Coast.	Midnight.	4	
Piti Palena, Patagonia, W. Coast.	12 23	10		—— Breakwater, England.	7 1	6½	4½
Piti River, Hindoostan, W. Coast.	10 5	9		Porto Frio, Brazil -	2 40	4½	
Placentia, Newfoundland	9 15	8		Porto Praya, C. Verde Ids.	6 0?	5	
Plank Point, Spencer Gulf, Australia, S. Cst.	6 15	6-8		Portree, Isle of Skye -	6 32	15	10½
Playa de Incia, Cuba -	7 31	2½		Portrieux, France -	6 0	31	23½
Playa Marie Bay, California.	9 20?	7-9?		Portsbridge (Portsmouth) England.	11 48	6½†	4
Playa Parda Cove, Magellan Strait.	1 8			Portsmouth Dockyard, England.	11 41	12½	10
Pleasant Port, Falkland Islands.	5 0	6½		Portsmouth, United States	11 23	10	8½
Plettenberg Bay, Africa, S. Coast.	3 10	6		Possession Bay, Magellan Strait.	9 0	36-42	
Ploughrescan, France -	5 17	25½	18½	—— Cape, Torres Strait.	9 0	6	
Ploumanach, France -	5 15	24½	18½	—— Id., Torres St.	1 0	9½	
Plumper Cove, Howe Sound, G. of Georgia, British Columbia.*	noon.	12		Post Office Island (Charles Island), Galapagos.	2 10	6	

* From observations made in the month of October.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Post Office Id., Torres Str.	1 0	9½		Quaco, Bay of Fundy -	11 35	30	25
Pouinipet Island, Caroline Islands, N. Pacific.	6 0	4½		Quan-chow-wan, Gulf of Tongking.		9-10	
Poulamente B., Madame Id., C. Breton Id. -	7 50	6	4	Quatsino Sound, Vancouver Id.	11 0	11	
Poulton-le-Sands, England	11 26	27½	21½	Quebec, R. St. Lawrence	6 38	18	13
Poverty Bay, New Zealand	6 5	6		Queda, Malacca Strait -	12 0	5½	
Pratas Shoal, China Sea	4 0	5		Queen Charlotte Sd. (entrance), New Zealand.	8 50	8	6
Preservation Inlet, New Zealand.	11 20	8	6	Queensferry, Firth of Forth, Scotland.	2 37	18	14
Preston, England - -	11 49	10	4½	Queenstown, Ireland -	5 1	11½	9
Prince Frederick Harb., Australia, N.W. Cst.	12 0	28		Quelan Cove, Patagonia, W. Coast.	0 28		
Prince Regent River (St. George Basin), Australia, N.W. Coast.	12 20	24-37		Quentin, Port San, California.	9 5	9	
Prince of Wales Strait, Banks Land.		3		Quicavi Bluff, Patagonia, W. Coast.	0 57	20	
Princes Id., Bight of Biafra	3 45	4½		Quicks Hole (S. side), U.S.	7 36	3½	3½
Princess Royal Harbour, Australia, S. Coast.	11 56	1-4		———— (N. side) -	7 31	4½	3
Prospect River, Nova Scotia.	7 43	7	6	Quilca River, Peru -	8 0	6	
Prony Bay, New Caledonia.				Quilimane R. (entrance), Africa, E. Coast.	4 15	16	
Provincetown, U. S. -	11 22	10½	9½	Quillebœuf, France -	10 6	9½	7½
Pubnico (Beach Point), Bay of Fundy.	9 25	12	10	Quiloa, Africa, E. Coast	4 45	12	
Puerto Bueno, Patagonia, W. Coast.	1 40			Quoile Quay, Strangford, Ireland.	12 45	11	9½
Puerto de Baitiqueri, Cuba.	9 7	2½		Rabat, Africa, W. Coast	1 46	9-12	
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	10		Race, Cape, Newfoundland.	7 0	6½	5
Puerto de Maravi, Cuba	7 56	2½		Rachada Cape, Malacca Strait.	5 30	13	
Puerto de Mata, Cuba -	6 49	2½		Radama Port, Madagascar, W. Coast.	4 40	13	
Puerto de la Plata, St. Domingo.	7 30	3?		Ragged Id., Sumbawa, Java Sea.	8 10	3	
Puerto de Taco, Cuba -	8 49	2½		———— Point, Borneo, E. Coast.		7	
Puget Sound (Nisqually), America, N.W. Coast.	6 0	18	15	Raine Id., Torres Strait	8 10	10	
Pugwash Harbour, Nova Scotia.	10 30	7	4	Rajang River, Borneo -	4 45	13	9
Pulaski Fort, United States	7 20	8	7	Rajapur River (entrance)	11 0	9	7
Pulicat Shoals, Coromandel Coast.	9 25	2½		———— (town)	12 20	7	
Pulo Aor, Sumatra, N.E. Coast.		5		Hindoostan, W. Coast.			
Pulo Condore, China Sea, W. Coast.*	2 30	6½		Rajpuri River (entrance), Hindoostan, W. Coast.	10 40	11	6
Pulo Leat, Gaspar Strait	2 30	4		Ramos R., Bight of Benin	4 20	5	
Pulo Mendanao, Gaspar Strait.	2 30	4		Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Pulo Panjang, G. of Siam	7 0	2		Ramsay Sound, Wales -	6 0	17	
Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½		Ramsey, Isle of Man -	11 12	19½	16
Puluqui Id., Patagonia, W. Coast.	1 5			Ramsgate, England -	11 44	15	12
Puna Island, Ecuador -	6 0	11		Ramso Fiord, Norway -	10 45	7	
Pwlheli, Wales - -	7 46	13½	9½	Rangoon, Bay of Bengal, E. Coast.	5 30	21	14
				———— R. (entrance), B. of Bengal, E. Coast.	3 15	21	14
				Raoul or Sunday Island, S. Pacific.	6 0	5	
				Rappahannock (Saunders Wharf), United States.	3 2	2½	2

* From a French survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rás Hafún, Africa, E.C.	6 15	4		Rio Janeiro, Brazil -	3 0	4	3
Rás Jerdaffoon. <i>See</i> Guardafui Cape.				Rio Negro, Patagonia, E. Coast.	11 0	14	10
Rás Mohommed (Gulf of Akabah), Red Sea.	6 0	5		Rio Nunez, Africa, West Coast.	10 0	15	11½
Rás Sharmah, Arabia, S.E. Coast.	9 0	8		Ristegouche R., Campbell- town, G. St. Lawrence.	4 0	10	7
Rás-al-Kheimh, Persian Gulf.	11 45	7		Rivadeo, Spain, N. Coast	3 0	15	
Ras-al-Asidah { Arabia } Rás Shébali { S.E. } Rás-al-Hed { Coast }	8 30 10 0 9 30	5½ 10 9		Rivoli B., Australia, S.C.	10 0	4	
Rathmullan, Ireland -	5 42	12½	9	Rocas, Atlantic - - -	5 15	10	
Ratna-ghiri, Hindoostan, W. Coast.	10 30	8	6½	Roche Cape, R. St. Law- rence.	9 30	6	4
Realejo, Cent. America	3 6	11		Roche Harbour, Haro Strait.	irr.	12	
Reconlavi Inlet, Pata- gonia, W. Coast.	0 44	14		Rochefort, France -	4 6	17	13
Red Bay, Ceylon, South Coast.	2 20	2½		Rochelle, France - -	3 31	17	13
— (Pier), Ireland	10 31	4	4	Rockport, United States -	10 57	10½	8
— Labrador -	7 45	3½	1½	Rockall, N. Atlantic -	3 30	12	
— Id., Durian Strait -	5 0	10½		Rocky Id., G. of Siam -	4 0	4	
Redbridge, England -	{ 10 42 12 57 }	{ 8½ 8 }	6	Rodrigue Id., Ind. Ocean	1 45	6	
Refuge Cove, Bass Strait	12 5	8		Roebuck Bay, Australia, W. Coast.	0 30	30	18
Régneville, France -	6 20	35	26	Roji, Hindoostan, W.C.	1 40	18	14
Reikiavik, Iceland -	5 0	17½	19½	Romania Point (Malay Penin.), China Sea, W. Coast.	10 30		
Rendezvous Id., Borneo, S.W. Coast.		8		Romdals Ids., Norway -	10 45	6	
— Strait of	7 0	14		Rona (South) Light, Scotland.	6 20	14½	10½
Georgia.				Roodewall Bay, Africa, S.W. Coast.	2 30	6½	
Rendsborg, Denmark -	7 42	4		Roque, Cape St., Brazils		10	8
Renfrew, R. Clyde, Scot- land -	1 15	9		Roscoff, France - - -	4 46	23	17½
Resolution B., Marquesas	2 30	4		Rosel, Jersey, English Channel.	6 15	30	21½
— Port, Tanna Id.	5 35	3		Roshnoff Cape, America, N.W. Coast.	7 30	15	
Reunion Id., { (St. Pierre)	noon.	3½		Rota, Spain - - -	1 24	12½	8
Indian O. { (St. Denis)	0 22	2½		Rotterdam, Netherlands	3 45	7	
Reunion Id., { (St. Gilles)	1 0	2½		Rottneat Id., Australia, W. Coast.	7 50	2¾	
Indian O. { (St. Paul)	1 7	4		Rouen, France - - -	2 28		
Rewa Road, Fijii Islands. <i>See</i> Nukulan Port.				Rouge Harbour, New- foundland.	7 0?	2-4?	
Rhio, Rhio Strait -	10 0	7	5	Roundstone, Ireland -	4 28	13¾	10½
Ribble Lighthouse, Eng- land.	10 51	24	17	Rovama River, Africa, E. Coast.	4 0	16	11½
Richibucto R., Gulf St. Lawrence.	3 30	4	2½	Royal Harbour, Ruatan, Bay of Honduras.	7 45	3½	
Richmond, United States	4 28	3½	2¾	Royal Island, Bahamas -	7 45	3½	
— Island, U. S.	11 30	10½	9	Royalist Port, Palawan, E. C.	11 0?	6½?	
— Harb., Prince Edward Island.	6 0	3	2	Royan, France - - -	3 38	13½	10
— R., Australia, E.C.	9 20			Ruapuke Id. (Foveaux St.) New Zealand.	1 0	8	6
Rio de la Plata, Cape Castillos.*	8 30	2		Rugged Id., Bahamas -	8 0	3	
— Buenos	12 0	3-5		— Nova Scotia	7 59	7½	6
Ayres.				Ruggles B., Falkland Ids.	7 30	5	
— Barragan	7 0	5-9		Rupon, Hindoostan, W. Coast.	10 30	10	7
Bay, S. America, E. C.							
Rio Grande do Sul, Brazil.		1½-2					

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rush Port, Ireland -	6 8	5½	3½	San Juan del Sur, Cen- tral America.	3 8?	10?	
Rutland Id., Ireland, W.C.	5 22	11	8	— River, New Granada.	6 0	12	
Ryde, England -	11 20	13½		San Lucar, Spain -	1 53	12½	8
Rye Bay, England -	11 20	22	17½	San Miguel, California -	9 25	5	4
Sabine Pass, G. of Mexico		1½		San Pedro Anchorage, California.	9 45	4½	3½
Sable Cape (Clam Point), B. of Fundy.	8 27	8½	6½	San Rosa Id., California	9 30?	5?	4?
— (Clarkes Harb.), B. of Fundy.	8 58	11	9	Sand Cay, United States	8 40	2	1
Sable Island, N. side, Nova Scotia.	7 30	4		Sandalwood Bay, Fijii Ida.	6 0	6?	
Sable Island, S. side, Nova Scotia.	6 30	4		Sand Point, G. of Liau- tung, Yellow Sea.	4 50	7	5½
Sables d'Olonne, Les, France.	3 26	14	10	Sands Pnt., United States	11 13	9	7½
Saboga, New Granada -	4 9	14		Sandwich Port, Malicollo Id., Banks Ids.	5 30	4	
Sabon Id., Durian Strt. -		10		Sandy Cape, Australia, E. C.	7 50	6-8	
Sacred Bay, Newfoundland	7 23	2½		— Cove, E., B. of Fundy	10 33	21½	17½
Sacrificios Pnt., Mexico, W. Coast.	3 15	6		— Cove, W., Bay of Fundy.	10 47	23	19
Saddle Id., East, China, E. Coast.	11 0	14		— Hook, United States	7 29	5½	5
Sado (Yebisu), Japan Sea	5 0	2		— Id., Madagascar, W.C.	5 0	15	
Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8	— Islet, Anstralia, W.C.	10 35	18	
Saguenay, Tadousac, G. St. Lawrence.	2 45	17	10	Sang-tau B., Yellow Sea	0 55	7	4½
Saigon (C. St. James) -	11 0	8		Sanguanga (entrance) Ecuador.	4 10	9	
— (Saigon City), Cochin China.	5 30	9½		Sanguir Island, Moluccas		6	
Saintes, Caribbean Sea -	6 45			Sangwin R., Africa, W. Cst.	5 15	4	
Saipan Id., Ladrone Ids.	6 45	2½		Sanmoon Bay (St. George Island), China, E. Coast.	10 20	15	
Sal, C. Verde Ids., Africa, W. Coast.	7 45	5		Sannana Bay, Moluccas		9	
Salango Id., Ecuador -	12 41	12		San-shui, Si Kiang, China, E. Coast.		5-6	
Salcombe, England -	5 41	15	11½	Santa Catalina Id., Cali- fornia.	9 35?	5?	4?
Saldanha B., Africa, W.C.	2 0	6		Santa Cruz R., Patagonia, E. Coast.	9 30	40	29
Sale Macowa, Red Sea -	0 30	2		Santa Cruz or Agadir, Africa.	12 45	9	
Salem, United States -	11 13	10½	9	Santa Island, California	9 35?	5?	4?
Salm R., Africa, W. Cst.	8 10	6		— Tenerife, Canary Ia.	1 30	8	
Salmedina Rocks, Spain	1 2	12½	8	Santa Maria Island, Chile	10 20	6	
Salomon Ids., S. Pacific	6 4	2		Santander, Spain -	3 30	15	12
Saltash, R. Tamar, Eng- land.	5 45	15	11	Santiago de Cuba, Cuba	8 33	2½	
Salt Cay Anchorage, Bahamas.	8 15	4	3	Santona, Spain -	3 30	12½	10½
Saltees, St. George's Channel.	5 40			Saparoa Id., Moluccas -		6	
Salvador, San, Port, Falk- land Islands.	8 10	8		Sapie Bay, Sumbawa -	1 0	10	
Samanco B., Peru -	6 30	2		Sarawak R. (Moratabas entr.)	4 0	9	5½
Sambilangs, Malacca St.		12	10½	— Santubong (entr.)	4 0	10	6
San Francisco (North Beach), California.	12 6	4½	3½	— Sarawak Junction	5 0	15-18	9
San Bartholomew Port, California.	9 10?	7-9?		— City -	5 20	15-18	9
San Blas, Patagonia -	1 30	12	10	Borneo, W. C.			
— Mexico, W. C.	9 41	6½		Sarn Badrig or the Causeway, Wales.	7 30	13	
San Fernando, Trinidad -	4 38	5	3	Sarn-y-hwch Reef, Wales	7 40	14	
San Juan (anchorage), California.	9 40?	5		Sau-o Bay, Formosa -	10 0	3½	
				Saugor Id., B. of Bengal		12	6-9
				Saumarez Reef, Australia, E. Coast.	8 0	6	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Savannah (city), U. S. -	8 13	7½	6½	Seypan Id., see Saipan.			
—— (entrance), U.S.	7 20	8	7	Seven Islands, Lapland -	8 20	12	5
Scales Point, Blackwater	12 0	14½	10	—— Bay, Gulf	1 40	9	
River, England.				St. Lawrence.			
Scalloway, Shetland -	9 30	5½	4½	Sha-lui-tien Banks (west	2 50	10	8
Scapa, Orkneys -	9 5	10	7½	part), Yellow Sea.			
Scarborough, England -	4 11	15½	12½	Sháb Kadún, Arabia,	9 20	10	
—— Shoal, Fili-	11 0	5		S.E. Coast.			
pinas.				Sháb'bu-saifeh, Arabia,	9 45	10	
Scarcies Rivers, Africa,	7 10	10		S.E. Coast.			
W. Coast.				Shalbet Island, Hindoo-	12 0	9	7
Scarnish, Tiree Id.,	5 31	12	9	stan, W. Coast.			
Scotland.				Shallow Harb., Falkland	9 30	6	
Scilly (St. Agnes Id.) -	4 30	16	12	Ids.			
—— (St. Mary Id.),	4 18	15½	11½	Shanghai, Yang-tse-Kiang,	0 40	10	7
England.				China, E. Coast.			
—— Trescow -	4 22	16½	12½	Shao-king, Si Kiang,		3	
Sea Bear Bay, Patagonia,	12 45	20		China, E. Coast.			
E. Coast.				Sharja, Persian Gulf -	1 0	6	
Seaforth Loch, Athline,	6 16	15	10	Sharks Bay, Naturaliste	11 45	6	
Scotland.				Channel.			
Seaham, England -	3 24	14½	10½	—— Denham Sd.	12 5	5	
Seal Cove, Grand Manan,	10 54	20	15	—— Freycinet	3 0	5	
B. of Fundy.				Reach.			
Seal Id., C. Sable, Bay of	9 49	12½	10½	—— Freycinet	4 15	3½	
Fundy.				Estuary.			
Seamount Bay, Mulroy	6 44	7½		—— Cape Perron	12 45	5½	
B., Ireland.				—— Hamelin Pool	5 0	3½	
Sebastian, San, Brazil -	2 0	4		—— Australia,			
—— Tierra del Fuego	7 0			N.W. Coast			
—— Spain, N. Coast	3 0	12	9	Shediac Harbour, New	{ 1 0 }	4	2
—— B., Africa, S.C.	3 8	6		Brunswick.	{ 8 0 }		
Sedashigar Bay,* Hin-	10 0	6½	5	Sheephaven, Ireland -	5 32	11½	8½
doostan, W. Coast.				Sheerness, England -	0 37	16	13½
Sedili R., China Sea, W.C.	9 44	7		Sheet Harb., Nova Scotia	8 6	6½	4½
Seer River, Hindoostan,	10 30	11		Sheseen Island, Africa, S.C.	4 40	12	
W. Coast.				Sheffield Island, U. States	10 58	8½	7½
—— Juggee -	1 30	6		Shelburne, Nova Scotia -	8 4	7	5½
Segoro Wedie Bay, Java	9 0	8	10	Sheldrake Island, Gulf	6 0	5	3
Sen, Isle de, France -	3 21	17½	12	St. Lawrence.			
Seleney Bay, Lapland -	7 9	9		Sherbro R., Afric., W. Cst.	6 0	11	
Selsea Bill, England -	11 45	16½	12½	Shields, North, England	3 23	13½	10
Semiahmoo Bay, Gulf of	2 0	12		Shihtau Bay, Yellow Sea	1 30	9	7
Georgia, America,				Ship Harb., Nova Scotia	7 54	6½	4½
N.W. Coast.				—— (New Id.),	10 30		
Senegal (Bar) -	8 42	6		Falkland Islands.			
—— (Guet N'dar) -	8 42	6		Shippigan, Gulf St.	3 42	5½	3
—— (St. Louis), Africa,	10 0	6		Lawrence.			
W. Coast.				Shoal Bay, Australia, N.C.	6 0	18-25	14-20
Serraia, Hindoostan, W.C.	1 0	16	13	—— E. Coast -	8 30		
Serrana Bank, Mosquito C.		2		Shoal Water B., Australia,	10 30	12-18	
Serranilla Bank, Mosquito	irr.	2		E. Coast.			
Coast.				Shoreham, England -	11 34	18	13½
Sesham Islands, Hang-chu	11 45	14		Shushartie B., Vancouver I.		12	
Bay, China, E. Coast.				Si Kiang or West River,			
Setubal, Portugal -	2 30	8	11½	China, E. Coast:			
Seudre, R., (entr.), France	3 31	15		„ (San-shui) -			5-6
Seychelle Archip. (Mayhé	4 0	6½		„ (Shao-king) -			3
Id., Indian Ocean).				„ (Wuchan) -			1-1½
Seymour Narrows, Bri-	4 0	11		Siak River, Malacca Strt.	9 0	12	
tish Columbia.				—— off the town -		11	

* Spring tides rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sidmouth Cape, Australia, E. Coast.	9 15	10		Sofala R., Africa, E. Coast	4 0	19	
Sierra Leone, Africa, W.C.	7 55	8		Solitary Ids., Australia, E. Coast.	9 15	5	3
Sillebar R. (Bar), Sumatra	6 0	4½		Solomon Ids., Indian Ocean	1 30	5	
Simidsu, Japan Sea -	7 30	7		Solovet Road, White Sea	5 0	4	
Simoda Port, Japan Sea	5 0	3-5		Solway (Tarn Point), Scotland.	11 22	23	19
Simonoseki, Japan Sea -	8 30	8	6	Sooke Harbour, Vancouver Island.	2 0	8	
Simons Bay, Africa -	2 44	5½	3½	Soonmianee Harbour, Persian Gulf.	9 0	9?	
Simons St., Island, U.S.	7 43	8½	6½	Sosnovaia Bay, White Sea	2 40	6	
Simpson Port, N.W. Coast of America.	0 35	21½	14½	Sosnovets, White Sea -	11 44	18	
Singapore, New Harbour, Malacca Strait.	9 45	10	7½	Souma, White Sea -	6 30	5½	
Singoteer Mata, Hindoostan, W. Coast.	5 20	24		South Farallon, California	10 37	4½	3½
Sinou, Africa, W. Coast -	5 0	4		South Rock, Ireland -	10 58	13	10½
Sir C. Hardy Ids., Torres Strait, E. Coast.	9 15	10		Southampton, England -	{ 10 30 } 12 45	13	9½
Sir E. Pellew Islands, Australia, N. Coast.	7 30	4-7		South West Bay, New Providence.	7 30	4	
Sisal, Gulf of Mexico -		2		—Cape, N. Zealand	12 0	7	5
Sitka, America, N.W.C.*	0 34	5-7		Southernness, England -	11 20	28	
Skaapen Fiord, Færø Islands :				Southwold, England -	10 20	6½	4½
Between Stormoe and Sandoe.	5 0	9½	7½	Spain, Port of, Trinidad -	4 30	4	2½
Between Hestoe and Sandoe.	5 30	9½	7½	Spensers Anchorage, Bay of Fundy.	11 42	39	33
Skagen or the Skaw, Jutland.	5 56	1		— B., Africa, S.W.C.	10 50	5-6	
Skerry, Great, E. side, Pentland Firth.	11 4	7¾	6½	Spenser Gulf, (Thorny Passage,) Australia, S.C.	12 0	6-8	
Skerry, Great, W. side, Pentland Firth,	10 53			— Point Lowly -	7 0	6-8	
Skerries, Ireland, N. Cst.	6 15	5	3	— Port Augusta† -	8 30	9-12	
Skerries, E. Coast. -	11 0	13	10	— Point Riley -	5 45	4½	
Skip Ness, Scotland -	11 50	9		— Wallaroo -	irr.	4-5	
Skull, Ireland -	4 2	9¾	7½	Sphax Roads, Mediterranean.	4 30	5	3
Slaughden, Orford, England.	1 0	7½		Spicers Cove, B. of Fundy	11 35	37	30½
Slievebane Bay Ireland, W. Coast.	5 49	10½	7½	Spider Id., China, E. C. -	10 0	17	
Sligo Bay (Mullaghmore) Ireland.	5 18	11½	8½	Spitzbergen (Bell Sound)	8 56	3½	
— Harbour, Ireland	5 23	11½	8½	— Danes Sound	0 24	5½	
Slyne Hd., Ireland, W.C.	4 30	13½	10	Spurn Pt. (Humber R.), England.	5 26	18½	15
Smalls Lighthouse, St. Georges Channel.	6 0	21		Staten Island, Tierra del Fuego.	4 30	8	
Smerwick, Ireland -	3 50	11½	8	Staunton Id., Yellow Sea	1 30	8	5½
Smithville, United States	7 19	5½	4½	Steilacoom Fort, Oregon	4 46	11	9½
Smoky Bay, Australia, S. Coast.	12 15	6		Stephen Port, Australia, E. Coast.	9 0	6	
Smyth Harbour, Tierra del Fuego.	12	6½		— Falkland Islands.	7 45	7½	
Snape Bridge, Orford, England.	3 0	6		Stewart Harbour, Tierra del Fuego.	2 50	4	
Socoa, France -	3 19	12½	8½	Stirling, Firth of Forth, Scotland.	3 52	7½	4½
Society Bay (Sullivan Bay), Yellow Sea.	0 15	8		Stirrup Cays, Bahamas -	7 0	4	
Socotra Id., Indian Ocean.	7 20	8		Stockton (Tees), England	4 40	11	
				Stonefield (Loch Etive), Scotland.	7 3		
				Stonehaven, Scotland -	1 10	14	11
				Stonington, United States	9 7	3½	3
				Stornoway, Lewis Island, Scotland.	6 46	13	9½

* The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation, (1862,) the local pilots say the rise sometimes is as much as 16 feet.

† At Port Augusta, when the winds veers round to West and South, and blows strong, the rise has been as high as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Strangford (Killard Point), Ireland.	10 58	14	11½	Table Bay, Africa, W. Cst.	2 40	5	
— Quay - -	12 31	10½	8½	Tabou R., Africa, W. Cst.	4 45	3-4	
— Head of Lough (Turley Rocks).	12 44	11½	9½	Tabuai Island, S. Pacific		3	
Streaky Bay (Blanchepoort), Australia S. C.	1 0	5		Tadeo, San, River, Patagonia, W. Coast.	11 45	6	
Stroma, S. side, Pentland Firth.	9 47	7½	6	Tahiti, S. Pacific -	noon.	1½	
Stromness, Orkneys -	9 0	10	7½	Tahrí, Persian Gulf -	5 0?		
Stuart Channel (Oyster Harbour).	6 0	10		Tai-cho ho, Yellow Sea -	0 15	6	
— Cowitchin Harb., Vancouver Id.		10-12		Taichow Ids., China, E. C.	9 0	14	
Stuart Island, Strait of Georgia.	6 0	12-14		Tai-Tai Bay, China Sea, E. Coast.	9 30	5½	
Sturge Narrows, Strait of Georgia.	6 0	12		Talcahuano, Chile -	10 14	5	
Suadiva Atoll, Maldives	1 0	4		Talcan Island, Patagonia, W. Coast.	1 3	15½	
Sual Port, Luzon - -		6		Tailung Channel, Canton River, China.	1 30	6½	
Sueroe Fiord, Færoe Ids.	6 0	9½	7½	Ta-lien-whan Bay, Yellow Sea.	10 47	10½	8
Suez Bay (head of Gulf), Red Sea.	2 0	6		Tama no Ura Harbour, Goto Id., Japan Sea.		6-8	4-6
Sughrá, Arabia, S.E. Cst.	8 0	6		Tam-Sui Harbour, China Sea, E. Coast.	11 45	7-12	
Sumburgh Head, Shetland	9 45			Tamar R., George Town, Tasmania.	12 5	10	7½
Sunday or Raoul Island, S. Pacific.	6 0	5		Tamar R., Launceston, Tasmania.	1 0	12½	
Sunderland, England -	3 22	14½	11	— Port, Magellan Strait.	3 5	5	
— N., England -	2 30	15	11½	Tamatave, Madagascar, E. Coast.	4 18	8	
Supé Bay, Peru - -	4 50	3		Tampa Bay, United States	11 21	1½	1½
Surat (entrance), Hindoostan, W. Coast.	2 45	19	15	Tanabé, Ki Channel, Japan Sea.	6 0	6	5½
— (town), Hindoostan, W. Coast.	4 0	19		Tanera, Summer Islands, Scotland.	6 37	14	10½
Surin, St., France - -	4 11	14½	11	Tangier, Africa, N. Coast	1 42	8	
Surinam, Guayana -	6 0	5½		Tangtang Harbour, Madagascar, E. Coast.	4 30	6	
Sussex Port, Falkland Ids.	8 15	6		Tanjong Api, China Sea		7	
Sutton Pool, England -	5 32	15½	11½	Tanjong Bolus, Malacca Strait.	9 30	10½	8½
Sviatoi Nos, Lapland -	9 15	14		Tanna, New Hebrides -	5 35	3	
Svineo Fiord, Færoe Ids.	12 0	6½	4½	Tappahannock, U. States	0 42	2	1½
Swain Reefs, Australia E. Coast.	10 25	10		Tappanoely Harbour, Sumatra.	6 10	6	
Swan Id., Bass Strait -	9 35	6		Taranaki or New Plymouth, New Zealand.	9 30	12	9
— Point, Australia, W. Coast.	0 10	26		Tarbert, Ireland - -	4 57	14½	10½
Swan River, Gage Road	8 50	2½		Tarifa, Spain - -	1 46	6	3½
— Port Grey, Australia, W. Coast.	9 0	1-1½		Tarn Pt., Solway, Scotland.	11 22	23	18
Swansea, (Mumbles Lighthouse), Wales.	6 1	27½	20½	Tarpaulin Cove, United States.	8 4	2½	2½
Swatau, China, E. Coast	3 0	9		Tarrytown, United States	9 57	4	3½
Swift Bay, Australia, N. Coast.	12 0	18		Tatamagouche, Nova Scotia.	10 0	8	5
Swona, E. side, Pentland Firth.	10 24	10	7½	Tatiyama Bay, Japan Sea	5 50	5	
— W. side, Pentland Firth.	9 35	10	7	Tauranga Harbour, New Zealand.	7 10	6	4½
Sydney, Australia, E. Cst.	8 38	4½	4	Tavoy R., (entrance) Bay of Bengal, E. Coast.	10 30	20	
Sydney Harb., Cape Breton	9 0	5	4				
Ta-tsing ho Yellow Sea -	4 10	10½	8				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tay River (Bar), Scotland.	2 6	16	14	Tooniang Id., Bias Bay, China, E. Coast.	8 0		
Tay-bay-oo-bay, China Sea, E. Coast.	10 15	6		Topaze Harbour, British Columbia.	3 0	16	11½
Tebonkos Road, Baly. (N. Coast.)	5 0	6½		Torbay, England - -	6 0	13½	10
Teelin Harb., Ireland -	5 16	11½	8½	Toro Point, Chile - -	9 45		
Tees R. (Bar), England	3 45	15	12½	Tortola, Virgin Islands -	8 30	1½	
Teignmouth, England -	6 0	13	9½	Tortugas, Florida, U. S.	9 56	1½	1
Tellicherry, Hindoostan, W. Coast.	11 40	5	4	Tova or Na Vatu Reef, S. Pacific.	6 8	4	
Tenby, Wales - -	6 0	27	20	Towan Id., China, E. C.	9 20	13	
Tener Cape Verdife, Ids., (Santa Cruz).		8½	6	Tower Id., Galapagos -	?	?	
Terceira, Azores -	12 32	4½		Townshend Harb., Tierra del Fuego.	2 30	5	
Teriberka R., Lapland -	7 20	12		Townshend Port, Oregon	3 49	5½	5
Terschelling (West), Netherlands.	8 40	6	5	Tracadie, Prince Edward Island.	7 0	3½	2
Tetrina, White Sea -	3 17	7		Tracey Harbour, British Columbia.	12 0	16	11½
Tetuan, Africa, N. Coast	2 23	2½	1½	Tracy Island, Korea, S. Coast.	8 58	11½	8½
Texel (outside Shoals), Netherlands.	6 30	4	3½	Tree Islands, Norway -	11 45	7	
Thirsty Sound, Australia, E. Coast.	10 45	12-18		Trawbreaga Lough, Ireland.	6 10	11½	8½
Thomas St., Id., Africa -	3 25	4½		Tréguier, France - -	5 32	25	18½
Thompson Id., New Zealand.	11 30	8	6	Trek Island, White Sea -	10 48	20	
Thorny Passage, Spencer Gulf, Australia, S. C.	12 0	6-8		Trepassey, Newfoundland	7 0	6½	5
Thorsminde, Jutland -	3 34	2		Tréport, France - -	11 9	27	21
Three Hummock Island (E. side), Bass Strait.	10 30	10		Tres Cruces Point, Patagonia, W. Coast.	1 15	16	
Three Kings Islands, New Zealand.	8 0	7		Triangles, Gulf of Mexico		1½	
Three Points Cape, Africa, W. Coast.	4 0	4		Trieste, Adriatic -	9 35	3½	
Three Rivers, River St. Lawrence.	11 30	1		Trincomalie Har., Ceylon, S. Coast.	8 18	2	1½
Throgs Point, U. S. -	11 20	9½	7½	Tringano R., G. of Siam, China Sea, W. Coast.	8 0		
Thurso, Scotland - -	8 28	13½	9½	Trinidad (Port Spain), Caribbee Islands.	4 30	4	3
Ticao Island, (Port San Jacinto) Filipinas.	6 30	6		Trinity Bay (Bull Id.) Newfoundland.	7 22	3½	2
Tictoc Bay, Patagonia -	1 45	11		—— Harbour, Newfoundland.	7 10	3½	2
Tien-pak Harb., China, East Coast.	12 0	8½		—— Opening, Great Barrier Reefs.	9 15	7-12	
Timballier Bay, G. of Mexico.	irr.	2		Tripoli (Syria), Mediterranean.	10 20	2	
Tinghae, Chusan, China, E. Coast.	11 0	12	9	Tristan da Cunha, South Atlantic.		8	
Tobago, Caribbean Sea -	3 0	4	2	Triton Harb., Newfoundland.	7 0?	2-4?	
Tobermory, Isle of Mull	5 36	13	9½	Tromsø, Norway - -	1 45	8	
Toboe Ali Point, Banka Strait.	8 30PM* 10 0AM†	12		Troon, Scotland -	11 50	10	7½
Tomo (Seto-uchi), Japan Sea.	11 0?		5	Troubridge Shoals, Australia S. Coast.	3 30	6	
Tongatabu, S. Pacific -	6 50	4		Truro, England (Town Quay).	5 5	10	6
Tongsang Harb., China, E. Coast.	11 30	12		Tsang-chow Id., Bias Bay, China, E. Coast.	8 30		
Tonning, Germany -	2 1	9		Tsau-liang-hai or Chosan Harb., Japan Sea.	7 45	7	5
Toona, Gulf of Kutch, Hindoostan.	1 50	16	13				

* In S.E. monsoon.

† In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tsu-sima Sound, Japan Sea.	8 30	8	6	Valdivia Port, Chile -	10 35	5	
Tsugar Strait, Japan Sea	5 0	5		Valentia Harb., Ireland -	3 42	11	8
Tudri River (bar), Hindoostan, W. Coast.	10 0	6 $\frac{1}{2}$	5 $\frac{1}{2}$	Valentine Harb., Magellan Strait.	2 0		
Tudwall, St., Road, Wales	7 45	14		Valery St.en-Caux, France	10 46	27	21 $\frac{1}{2}$
Tumaco Road, Ecuador -	2 33	12		----- sur-Somme,	11 46	27	21 $\frac{1}{2}$
Tunis, Mediterranean -		3		France.			
Turks Islands, Bahamas		3		Vallay, North Uist, Scotland, W. Coast.	6 10	11 $\frac{1}{2}$	8 $\frac{1}{2}$
Turna Bay, White Sea -	9 54	11		Vallenar R., Patagonia, W. Coast.	0 18	5	
Turner C., Prince Edwd. Island.	6 10	4	2	Valparaiso, Chile -	9 32	5	
Turon B., Cochin China	3 0	4		Vanderlin Island, Australia, N. Coast.	9 30	7	4
Turtle Island (North), Australia, W. Coast.	11 0	18		Vansittart Bay, Australia, N.W. Coast.	9 15	6	
----- S. Pacific	6 11	4		Vansittarts Saddle, Yellow Sea.	4 20	10	8 $\frac{1}{2}$
Tuticorin Harb., G. of Manar, Bay of Bengal, W. Coast.	1 15	2 $\frac{1}{2}$	1 $\frac{1}{2}$	Vao Port. See Alcmène, New Caledonia.	8 6	4	
Tutukaka Harbour, New Zealand.	7 0	9	7	Vatoa or Turtle Island, S. Pacific.	6 11	4	
Tweed River (Danger Point), Australia E.C.	9 45	5-8		Veere, Netherlands -	1 20	15	
Twofold B., Australia, E.C.	10 0	7	5	Ventry, Ireland -	3 44	10 $\frac{1}{2}$	7 $\frac{1}{2}$
Tylatiap Harb. Java, S.C.	8 45	3 $\frac{1}{2}$		Venus Harbour, Australia, S. Coast.	2 15	6	
Tynemouth (Bar), England	3 20	14 $\frac{1}{2}$	11 $\frac{1}{2}$	Vera Cruz, G. of Mexico		2	
Tytando Inlet, Java -	6 30	5	3 $\frac{1}{2}$	Vermilion Bay, G. of Mexico.	irr.	2 $\frac{1}{2}$	1 $\frac{1}{2}$
Typa Anchorage, China, E. Coast.	10 0	7		Vernon Chan. (Chusan Arch), China, E. Coast	9 40	14	
Uinne, New Caledonia -	6 48	4 $\frac{1}{2}$		Versovah, Hindoostan, W. Coast.	12 0	16	13
Uist North (Kallin), Scotland, W. Coast.	5 59	13 $\frac{1}{2}$	9 $\frac{1}{2}$	Verte Bay, Nova Scotia	10 0	9	5
----- (Vallay), Scotland, W. Coast.	6 10	11 $\frac{1}{2}$	8 $\frac{1}{2}$	Victoria Port, Brazil -	3 0	4	
----- South. (Loch Boisdale), Scotland, W. C.	5 47	12 $\frac{1}{2}$	9 $\frac{1}{2}$	----- St. Juan de Fuca Strait.	irr.	7-10	5-8
Ullapool, Loch Broom, Scotland.	6 40	14 $\frac{1}{2}$	10 $\frac{1}{2}$	Victoria River, Holdfast Reach, Australia, N.W. Coast.	9 0	16	10
Ummen Nakheilab, Persian Gulf.	7 30?	8?		----- Mosquito Flat, Australia, N.W. Coast.	12 19	15-24	
Underwood Port, New Zealand.	6 10	8	6	----- Sandy Id., Australia, N.W. Coast.	1 17	3-10	
Union Bay, La Plata -	3 10	12	9	----- Turtle Pt., Australia, N.W. Coast.	7 15	7-13	
Union, Port la, G. of Fonseca, Cent. America.	3 15	10 $\frac{1}{2}$	8 $\frac{1}{2}$	Australia, N.W. Coast.			
Umsang, Borneo -	8 0	3 $\frac{1}{2}$		Vigo, Spain -	3 0	12-13	
Upernivik, Greenland -	11 0	8		Vila Harb., Sandwich Id., Banks Ida.	5 0	5	
Upstart Bay, Australia, E. Coast.	9 0	6		Vin Harbour, G. St. Lawrence.	5 45	5	3
Urakami, Japan Sea -	7 30	6	5	Vincent, St., Cape, Madagascar, W. Coast.	4 45	12	
Uranouchi, Japan Sea -			5	----- Caribbean Sea	3 0	1 $\frac{1}{2}$	1
Urie Firth, Shetlands -	9 45	6 $\frac{1}{2}$	5	----- Port St., New Caledonia.	5 50	4 $\frac{1}{2}$	
Ursula Id., Palawan, China Sea, E. Coast.	11 0	7 $\frac{1}{2}$		Vingorla, Hindoostan, W. Coast.	11 0	8	6 $\frac{1}{2}$
Usborne Port, Australia, W. Coast.	1 45	34		Virgin C., Magellan Strait.	8 30	36-42	
Ushant, France -	3 32	19 $\frac{1}{2}$	13 $\frac{1}{2}$				
Ushruffi Islands, Red Sea	6 14	2					
Utria, New Granada -	4 0	12					
Værö, Norway -	12 0	9	7 $\frac{1}{2}$				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Vivero, Spain, N. Coast.	3 0	15		Waterford (Bridge), Ire- land.	6 6	13½	10½
Viziadroog. . See Geriah.				Waterford (Duncannon Fort).	5 20	12½	10
Vladimir, St., Bay, G. of Tartary.	irr.	2		Waterloo Bay, Africa, S. Coast.	4 0	6	
Volcano Ids., China, E. Coast.	11 30	15	7½	Webling Point, Spencer Gulf, Australia, S. Coast.	6 10	6-9	
Voronov C., White Sea - Waagoe Fiord, Færoe Ids.	11 20 6 0	17 9½	7½	Week Islands, Tierra del Fuego.	2 0	5	
Waddington Harb., Bute Inlet, B. Columbia.	6 0	13		Wei-hai or Kyau-chau Bay, Yellow Sea.	5 0	12	9
Wahaay Harb. (Ceram), N. Coast, Moluccas.	6 0	3-4		Wei-hai-wei Harbour, Yellow Sea.	9 30	9	
Waikato R., New Zea- land.	9 30	12	9	Weir Head, R. Tamar, England.	6 17	5½	1½
Wairoa River, New Zea- land.	6 45	7	4	Welcome B., Patagonia, W. Coast.	0 50	7½	
Wakaya Id., Fijii Ids. - Wakefield Port, Aus- tralia, S. Coast.	6 0 5 0	4 9	3	Wellesley Is., Australia, N. Coast.	7 30	8-12	
Walker Creek, Choiseul Id., Falkland Ids.	6 20	5½		Wellfleet, United States	11 5	13½	12
——, R. Tyne, Eng- land.		10½		Wells, England -	7 0	12	
Wallace Har., Nova Scotia	10 30	8	5	—— Bar, England -	6 20	18	
Wallis Id., Torres Strait	irr.	7		Wenman Isles, Galapagos	2 10		
Walvisch Bay, Africa, W. Coast.	1 54	6		Weser (outer light vessel), Germany.	11 30		
Wanchu R. (entrance), China, E. Coast.	9 0	15½		West Cove, Kenmare R., Ireland.	3 52	10	7½
—— (City), China, E. Coast.	9 30	15½		—— Gat, Netherlands -	1 45	7	
Wang-kia Bay, Yellow S.	2 30	9	7	—— Hill, Australia, E. C.	10 20	24	
Wang-kia-tia Bay, Yel- low Sea.	6 0	12	9	West Quoddy, B. of Fundy	11 12	21	17
Wanganui R., New Zea- land.	10 15	8	6	West River, China, E. Coast, see Si Kiang.			
—— Inlet, New Zea- land.	11 20	7	6	Western Port, Australia, Muscle Rock.	0 12	8½	6½
Wangari Harbour, New Zealand.	7 0	9	7		1 13	10½	8½
Wangaroa Harbour, New Zealand.	8 15	7		Bourchier Channel.			
Wangaruru Harbour, New Zealand.	7 10	9	7		1 0	10	8
Wapitagan Harb., G. of St. Lawrence.	10 30	5	3	French Id. (Spit).			
Waree River, Hindoo- stan, W. Coast.	9 40	8		Westmanshaven, Færoe Ids.	8 0	9½	7½
Warleigh Quay, River Tavy, England.	5 47	14½	10½	Westness, Orkneys -	9 11	10	7½
Warnboro' Sd., Australia, W. Coast.		3-4		Weston-super-mare, Eng- land.	6 54	37	25½
Warrenpoint, Carling- ford, Ireland.	11 10	14½	12	Westport, Ireland -	4 57	12½	9½
—— Lough Foyle, Ireland.	6 20	6½	5	Wexford, Ireland -	7 21	5	5½
Warsheek Roads, Africa, E. Coast.	4 30	8		Whaingaroa Harbour, New Zealand.	9 50	12	
Watch Hill, United States	9 0	3	2½	Whampoa { In March -	1 40	} 7-8	
				(Docks), { In April -	1 15		
				China { In May & June	0 30		
				See foot note, p. 169.			
				Whitby, England -	3 45	15	11½
				White Dog Ids., China, E. C.	9 0	18	
				Whitehaven, England -	11 14	23½	18½
				—— Nova Scotia	8 0	6½	4½
				Wick, Scotland - -	11 22	10	7½
				Wicklow, Ireland - -	10 29	9	6½
				Wide Bay, Australia, E. C.	9 14	10	7

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Widewall, Orkneys -	9 3	10	7½	Wynkoops Bay, Java -	5 0	4½	4
Wigton, Scotland -	11 30			Yafa, Mediterranean -	10 0	1½	
Wilberforce Cape, Australia, N. Coast.	8 10	10		Yang ho, Yellow Sea -	0 15	6	
Wild Wave Bay, Loo Choo Islands.	8 0	8		Yang-tse Kiang (Light Ship at entrance), China, E. Coast.	12 0	15	10
William Prt., Falkland Ids.	5 15	7	5½	Yarmouth Haven (Brush), England.		5½	4½
-----New Zealand	12 45	8	6	-----Bay of Fundy	10 9	16	13
-----Scotland, W.C.	11 10	18	10	-----Bridge, England		5	4
Willis Islets, Australia, E. Coast.	8 0	6		-----Road, England	9 15	6	4½
Willoughby Cape, Kangaroo Id., Australia.	4 10	6		-----Isle of Wight, England.	{ 10 0 } { 12 0 }	7	6½
Wilmington, United States	9 6	3	2½	Yealm River, Bigbury Bay, England.	5 37	16½	11½
Wilson Promontory, Australia, S. Coast.	2 0	10		Yedo Bay, (Yoku-hama) Japan.	6 0	6½	4½
Winter Harb., Melville Id.	1 30	3½		Yellaboi, Africa, West Coast.	7 10	10	
Winterton Ness, England	8 25	7½	6½	Yeu, Ile d', France -	3 6	14½	10
Wisbeach, England -	7 30	15		Ylo Road, Peru -	8 15	6	
Wisbeach Eye, England		20		Yoku-hama, Yedo Bay, Japan Sea.	6 0	6½	4½
Wivenhoe, Colne River, England.	12 10	15	10	York C., Australia, East Coast.	11 15	10	7
Wolstenholm Sound, Arctic Regions.	11 8	7½		-----Factory, Hudson Bay	11 15	10-14	
Woodbridge or Bawdsey Haven (Bar), England.	11 45	12	9	-----River (Moody's Wharf), United States.	9 35	3½	
----- (Kingston Quay), England.	0 35	10		-----Road, Magellan St.	2 0	9	
Woodbridge, (Wilford Bridge), England.	0 55	7		-----Harb., Newfoundland.	10 37	5½?	
Woodlark Id., Louisiade Archip.	7 15	4		Youghal, Ireland -	5 14	12½	10
Woods Hole (entrance from Vineyard Sound), United States.	8 34	2	1½	Ythan River, Scotland -			
----- (entrance from Buzzard Bay), United States.	7 59	4½	4	Yu-lin-kan Bay, China Sea.	9 5	2½	
Woody Island, Australia, E. Coast.	9 14	10	7	Yung R., Chinhae, China, E. Coast.	11 20	12½	
Woolwich, England -	1 37	18½	15½	-----Ning-po-fu, China, E. Coast.	1 0	9	
Workington, England -	11 4	20	15	Yung-hing Bay, Japan S.	5 20	2½	
Wrabness, Stour River, England.	12 29	12		Yura Harbour, Japan Sea	6 5	6½	
Wranger Oog, Germany	12 0	9?		Zambezi River (Pearl Id.), Africa, E. Coast.	4 30	12-15	
Wrath Cape, Scotland -	7 30	15½		Zand Bay, Java -	5 0	4½	
Wreck Reef, (Bird Islet) Australia, E. Coast.	8 3	6		Zanzibar, Africa, E.C. -	5 20	10	
Wuchu, Si Kiang, China, East Coast.		1-1½		----- (Channel), Africa, E. Coast.	4 15	11	
Wusung River (entrance), Yang-tse-Kiang, China, E. Coast.	0 30	15	10½	Zaudzi, Mayotta, Comoro Ids.	4 10	12	
----- (Pheasant Point)	0 35	13	8	Zebú Port, Filipinas -	12 0	7	
				Zeyla, Africa, E. Coast	7 15	8½	
				Zieriksee, Netherlands -	2 0	11	9

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TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS,

FOR THE YEAR

1869 ;

ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.

COMPUTED BY STAFF COMMANDER J. BURDWOOD, R.N.

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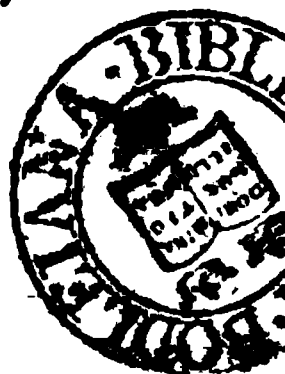
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1868.



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g the south coast of England - - - - -	108-117
the east coast of Great Britain - - - - -	112-117
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- - - - -	120-126
and change, with the rise of the tide at springs	
f 2600 of the principal places on the globe -	127-217

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BELFAST - Page	8	16	24	32	40	48	56	64	72	80	88	96
BREST - - - "	2	10	18	26	34	42	50	58	66	74	82	90
DEVONPORT - - "	2	10	18	26	34	42	50	58	66	74	82	90
DOVER - - - "	3	11	19	27	35	43	51	59	67	75	83	91
GALWAY - - - "	9	17	25	33	41	49	57	65	73	81	89	97
GREENOCK - - "	6	14	22	30	38	46	54	62	70	78	86	94
HARWICH - - "	4	12	20	28	36	44	52	60	68	76	84	92
HOLYHEAD - - "	7	15	23	31	39	47	55	63	71	79	87	95
HULL - - - - "	4	12	20	28	36	44	52	60	68	76	84	92
KINGSTOWN - - "	7	15	23	31	39	47	55	63	71	79	87	95
LEITH - - - - "	5	13	21	29	37	45	53	61	69	77	85	93
LIVERPOOL - - "	6	14	22	30	38	46	54	62	70	78	86	94
LONDON - - - - "	3	11	19	27	35	43	51	59	67	75	83	91
LONDONDERRY - "	8	16	24	32	40	48	56	64	72	80	88	96
PEMBROKE - - - "	6	14	22	30	38	46	54	62	70	78	86	94
PORTSMOUTH - - "	2	10	18	26	34	42	50	58	66	74	82	90
QUEENSTOWN - - "	9	17	25	33	41	49	57	65	73	81	89	97
SHEERNESS - - - "	3	11	19	27	35	43	51	59	67	75	83	91
SHIELDS (NORTH) "	5	13	21	29	37	45	53	61	69	77	85	93
SLIGO BAY - - - "	8	16	24	32	40	48	56	64	72	80	88	96
SUNDERLAND - - "	4	12	20	28	36	44	52	60	68	76	84	92
THURSO - - - - "	5	13	21	29	37	45	53	61	69	77	85	93
WATERFORD - - - "	9	17	25	33	41	49	57	65	73	81	89	97
WESTON-SUPER-MARE	7	15	23	31	39	47	55	63	71	79	87	95

N O T I C E.

If it be desired to reduce the Mean Time at any Place to that of Greenwich (or Railway) Time, (which latter is used in the Tide Tables, published in Liverpool and Glasgow,) the following correction must be applied to the Time given in these Tables :—

			Minutes.
Brest	-	-	+ 18
Devonport	-	-	+ 17
Portsmouth	-	-	+ 4
Dover	-	-	- 5
Sheerness	-	-	- 3
Harwich	-	-	- 5
Hull	-	-	+ 1
Sunderland	-	-	+ 5
North Shields	-	-	+ 6
Leith	-	-	+ 13
Thurso	-	-	+ 14
Greenock	-	-	+ 19
Liverpool	-	-	+ 12
Pembroke	-	-	+ 20
Weston-super-mare	-	-	+ 12
Holyhead	-	-	+ 18

For the Irish Ports, should Dublin Mean Time be required, the following correction must be applied to the time given in these Tables :—

			Minutes.
Kingstown	-	-	- 1
Belfast	-	-	- 2
Londonderry	-	-	+ 4
Sligo	-	-	+ 9
Galway	-	-	+ 11
Queenstown (Cork)	-	-	+ 8
Waterford	-	-	+ 3

The above corrections are also given at the foot of each page under the place for which the times and heights of high water are predicted.

[The result of a discussion of two years' observations (1866 and 1867) taken at the Shadwell upper entrance of the London Docks shows, that the mean spring range at the Docks has increased 13 inches during the last 25 years, attributable probably to the removal of obstructions, extensive dredging, and construction of the embankment. In the predictions for London in the tide tables for the present year, a mean spring range of 20 ft. 3 in. has been adopted instead of 19 ft. 2 in. hitherto considered as the range at the Bridge.]

ADVERTISEMENT.

In the following Tables the time of High Water is given to *Mean* time at Place. Those who are desirous of knowing the *Apparent* time, (or that shown by the Sun,) at which High Water occurs, must apply the equation of time, by addition or subtraction, as directed for that purpose.

The height of the tide in these Tables is calculated from the mean level of the low water of ordinary springs, because the soundings expressed in most charts are reduced to that level. The height therefore which is given at each place is the actual rise of high water above the mean low-water level of spring-tides.

In the column of the Moon's transit, (m) stands for morning, and (a) for afternoon.

The Moon's age is given in days, and tenths of a day, from the time of her conjunction, or change; thus, it is New Moon on the 11th of May, at 4 h. 7 m. in the afternoon, and therefore, on the 12th of May, at noon, the moon being 19h. 53 m. old, her age may be accounted as eight tenths of a day, and is expressed by 0.8.

The highest tides take place, on the west coast of Ireland and on the south coast of England, three transits after the New and Full Moon, unless diverted by gales of wind or other extraordinary causes. Along the east coast of England, they take place four transits after the New and Full Moon. In the river Thames they occur five transits after the same epoch. These differences arise from the cause, that the same tide-wave which produces high water on the west coast of Ireland takes half a day in its progress from thence to the east coast of England, and a whole day before it arrives in the river Thames.

The time of high water at Brest is added for the benefit of vessels navigating the north coast of France and the adjacent sea.

Immediately after the Tide Tables, at page 98, will be found a convenient method of deducing, from them, the height of the tide at any intermediate hour, between high and low water.

At page 100 are shown the depths on the dock-sills at Falmouth, Devonport, Plymouth, Portsmouth, Sheerness, Chatham, Woolwich, Deptford, London, Hull, Middlesbrough, Hartlepool, Sunderland, Newcastle-upon-Tyne, Leith, Cardiff, Pembroke, Liverpool, Birkenhead, Dublin, and Londonderry.

At page 103 will be found a collection of Constant Differences, by which the time and height of high water at certain other ports may be approximately found.

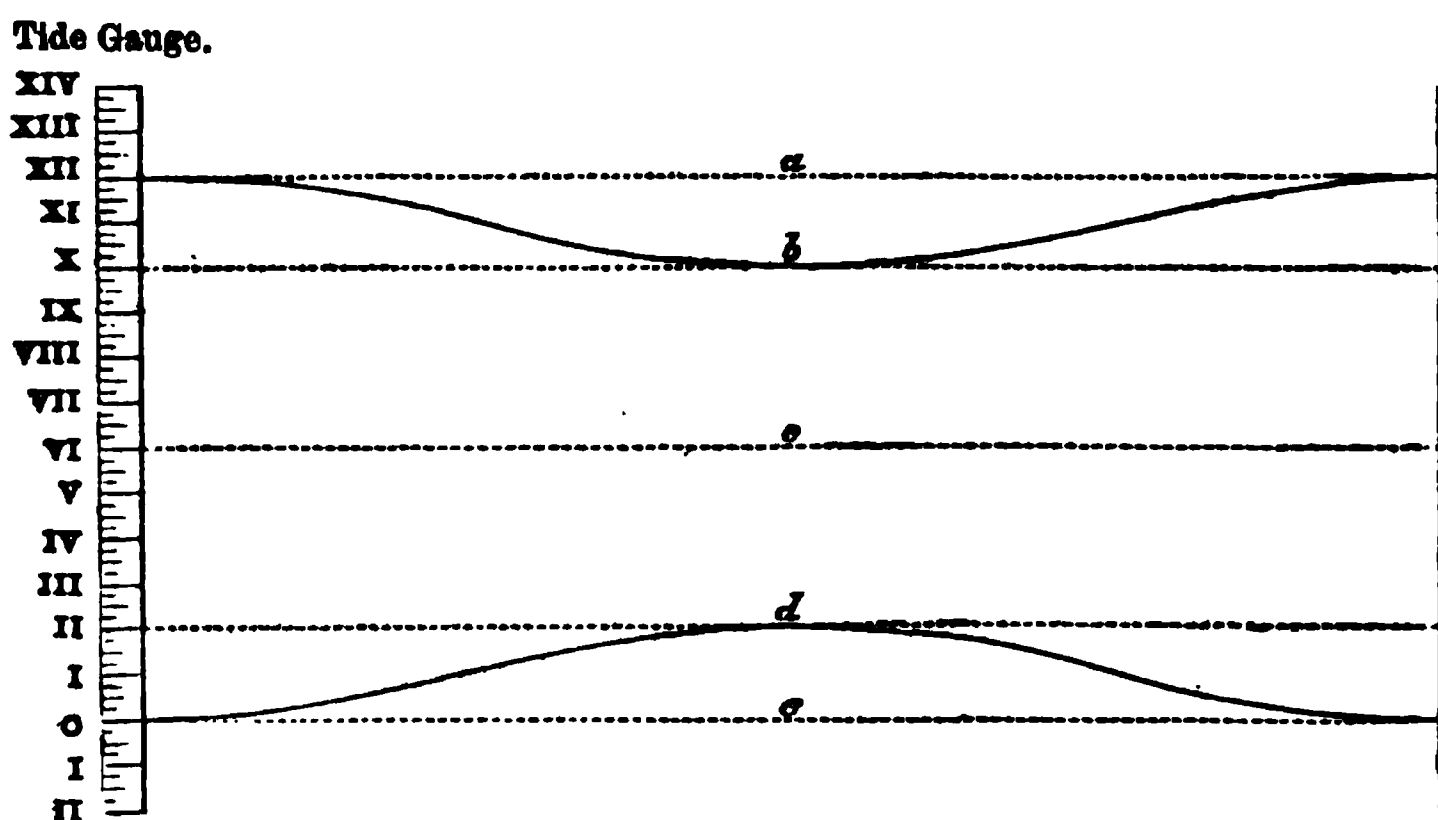
At page 108 a description is given of the general set of the tides in the neighbourhood of several parts of the coast, including a full account of the streams among the Orkneys, and through the Pentland Firth, by Captain F. W. L. Thomas, R. N. And, the development, by Rear-Admiral F. W. Beechey, of the movement of the great tide-wave up the English and Irish Channels, and into the North Sea; to which has been added a description of the set of the tides in the vicinity of Rathlin Island on the north coast of Ireland by Captain Richard Hoskyn, R. N.

Lastly, there is appended the time of high water on the days of Full and Change at various places on the globe arranged according to the apparent progress of the tide-wave, and also alphabetically; with the rise of the tide at springs and neaps.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge, the latter being given in these tables, by applying to the times at the docks $+10^m$ and to the heights -5^m)—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland, North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke, Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown, Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Mullaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Duncannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise, and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

	ft.
Spring Rise (or Mean Spring Range) = e to a	= 12
Neap Rise - - - = e to b	= 10
Neap Range - - - = d to b	= 8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1869.

TIDE TABLES FOR THE

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.								
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.						
F.	1	2m28	5 32	19 8	5 55	19 6	7 25	16 2	7 48	15 6	1 8	13 0	1 32	12 12												
S.	2	3 25	6 19	19 2	6 44	18 8	8 11	15 11	8 36	15 1	1 56	12 10	2 20	12 9												
S.	3	4 19	7 9	18 1	7 35	17 6	8 59	15 5	9 22	14 5	2 45	12 6	3 10	12 3												
M.	4	5 11	8 1	16 11	8 27	16 3	9 46	14 8	10 12	13 9	3 35	12 0	4 0	11 9												
Tu.	5	6 2	8 55	15 9	9 26	15 3	10 38	13 11	11 7	13 2	4 25	11 6	4 52	11 3												
W.	6	6 51	10 0	15 1	10 37	14 11	11 37	13 3	—	—	5 21	10 10	5 53	10 6												
Th.	7	7 41	11 14	14 9	11 53	14 11	0 13	12 11	0 50	13 1	6 27	10 7	7 3	10 6												
F.	8	8 31	—	—	0 28	15 1	1 25	13 0	2 1	13 3	7 40	10 8	8 17	10 10												
S.	9	9 21	1 1	15 4	1 31	15 9	2 35	13 4	3 7	13 6	8 52	11 0	9 23	11 2												
S.	10	10 12	1 56	16 2	2 19	16 7	3 37	13 10	4 4	14 0	9 50	11 5	10 14	11 7												
M.	11	11 3	2 41	17 0	3 3	17 4	4 29	14 4	4 53	14 3	10 36	11 8	10 59	11 10												
Tu.	12	11 53	3 25	17 8	3 46	17 9	5 16	14 9	5 37	14 6	11 21	11 11	11 42	12 6												
W.	13	0a42	4 5	17 10	4 23	17 11	5 57	15 0	6 16	14 6	—	—	0 1	13 9												
Th.	14	1 30	4 41	17 11	4 57	17 11	6 34	15 1	6 51	14 6	0 19	12 1	0 38	12 6												
F.	15	2 15	5 14	17 10	5 31	17 9	7 6	15 0	7 22	14 3	0 56	12 0	1 13	12 3												
S.	16	2 59	5 47	17 6	6 3	17 4	7 37	14 9	7 53	13 11	1 30	11 11	1 48	11 10												
S.	17	3 42	6 20	17 2	6 38	16 9	8 9	14 3	8 25	13 5	2 4	11 9	2 21	11 8												
M.	18	4 24	6 56	16 4	7 15	16 0	8 40	13 9	8 55	12 11	2 39	11 7	2 57	11 2												
Tu.	19	5 6	7 34	15 7	7 54	15 2	9 11	13 2	9 30	12 7	3 15	11 3	3 33	11 6												
W.	20	5 49	8 14	14 8	8 36	14 3	9 51	12 8	10 13	12 2	3 52	10 11	4 12	10 6												
Th.	21	6 34	9 3	13 11	9 33	13 9	10 37	12 3	11 3	12 0	4 34	10 6	4 59	10 6												
F.	22	7 22	10 6	13 8	10 43	13 9	11 34	12 0	—	—	5 27	10 1	5 59	10 6												
S.	23	8 14	11 23	13 11	—	—	0 8	12 1	0 47	12 2	6 34	10 0	7 11	10 6												
S.	24	9 9	0 1	14 3	0 38	14 9	1 27	12 6	2 5	12 9	7 48	10 4	8 26	10 8												
M.	25	10 7	1 10	15 5	1 40	16 2	2 42	13 2	3 16	13 6	9 1	11 0	9 32	11 6												
Tu.	26	11 8	2 8	16 11	2 34	17 9	3 48	14 3	4 17	14 4	10 1	11 9	10 29	12 6												
W.	27	morn.	2 56	18 7	3 20	19 3	4 45	15 1	5 12	15 0	10 52	12 5	11 16	12 6												
Th.	28	0 9	3 45	19 10	4 9	20 3	5 38	15 10	6 4	15 7	11 41	13 0	—	—												
F.	29	1 9	4 33	20 6	4 56	20 8	6 30	16 5	6 55	16 1	0 5	13 3	0 30	13 6												
S.	30	2 7	5 19	20 8	5 42	20 7	7 17	16 8	7 40	15 11	0 55	13 5	1 19	13 6												
S.	31	3 3	6 4	20 4	6 27	19 11	8 3	16 6	8 26	15 8	1 42	13 5	2 5	13 6												
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							

Half Mean Spring } 9ft. 6in.
Range

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	5	6	22	Morning.
New- - - - -	12	6	53	Afternoon.
First Quarter-	21	0	26	Morning.
Full - - - - -	28	1	30	Morning.
In Perigee- -	16	7	0	Afternoon.
In Apogee- -	29	1	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	14	N.48	9	17	S.28	17	7	S. 0	25	19	S.38
2	10	58	10	19	10	18	3	6	26	19	S.30
3	6	31	11	19	54	19	0	N.57	27	18	41
4	1	47	12	19	40	20	5	1	28	16	10
5	2	S.56	13	18	30	21	8	57	29	12	35
6	7	26	14	16	31	22	12	37	30	8	15
7	11	28	15	13	51	23	15	46	31	3	57
8	14	52	16	10	37	24	18	12			

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—
 BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				ONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.		
1	0 42 19 4	1 9 19 3	2 16 16 6	2 39 16 6	3 46 20 8	4 10 20 8	18.4							
2	1 35 19 2	2 0 19 0	3 2 16 5	3 25 16 3	4 32 20 7	4 56 20 6	19.4							
3	2 26 18 8	2 51 18 3	3 49 16 0	4 14 15 9	5 20 20 4	5 46 20 0	20.4							
4	3 16 17 10	3 41 17 4	4 39 15 5	5 5 15 1	6 11 19 6	6 36 19 1	21.4							
5	4 6 16 10	4 31 16 4	5 32 14 9	6 0 14 5	7 2 18 8	7 31 18 3	(
6	4 58 15 10	5 27 15 6	6 31 14 1	7 5 13 10	8 1 17 10	8 34 17 6	23.4							
7	5 57 15 4	6 30 15 3	7 41 13 9	8 19 13 9	9 9 17 4	9 44 17 4	24.4							
8	7 6 15 5	7 43 15 8	8 55 13 10	9 31 14 0	10 20 17 6	10 56 17 8	25.4							
9	8 17 15 11	8 46 16 2	10 5 14 2	10 37 14 4	11 31 17 11	— —	26.4							
10	9 13 16 5	9 37 19 9	11 5 14 6	11 30 14 9	0 4 18 2	0 32 18 5	27.4							
11	10 1 17 0	10 25 17 3	11 52 14 11	— —	0 59 18 9	1 23 19 0	28.4							
12	10 49 17 5	11 11 17 6	0 13 15 1	0 35 15 3	1 47 19 2	2 8 19 3	●							
13	11 32 17 7	11 52 17 8	0 57 15 4	1 19 15 5	2 29 19 4	2 48 19 5	0.7							
14	— —	0 12 17 9	1 37 15 6	1 55 15 6	3 7 19 6	3 24 19 6	1.7							
15	0 30 17 9	0 49 17 9	2 12 15 5	2 28 15 5	3 42 19 6	3 58 19 6	2.7							
16	1 8 17 8	1 26 17 6	2 44 15 4	3 1 15 3	4 14 19 5	4 31 19 5	3.7							
17	1 43 17 5	2 1 17 4	3 17 15 2	3 33 15 0	4 48 19 4	5 6 19 3	4.7							
18	2 19 17 1	2 38 16 9	3 50 14 10	4 8 14 8	5 23 19 1	5 39 18 10	5.7							
19	2 57 16 6	3 15 16 3	4 26 14 5	4 45 14 3	5 56 18 6	6 14 18 2	6.7							
20	3 33 15 11	3 53 15 3	5 4 14 0	5 24 13 9	6 33 17 10	6 53 17 6	7.7							
21	4 14 15 3	4 38 14 10	5 47 13 7	6 12 13 4	7 15 17 3	7 40 17 0)							
22	5 4 14 6	5 33 14 4	6 40 13 1	7 13 13 0	8 9 16 8	8 42 16 6	9.7							
23	6 4 14 4	6 38 14 6	7 48 13 0	8 25 13 1	9 17 16 6	9 53 16 8	10.7							
24	7 14 14 11	7 52 15 5	9 3 13 4	9 40 13 8	10 29 16 11	11 5 17 3	11.7							
25	8 26 15 11	8 55 16 6	10 15 14 0	10 46 14 4	11 40 17 8	— —	12.7							
26	9 24 17 1	9 52 17 8	11 14 14 9	11 41 15 2	0 13 18 2	0 43 18 8	13.7							
27	10 18 18 3	10 44 18 9	— —	0 6 15 6	1 9 19 3	1 34 19 8	14.7							
28	11 11 19 3	11 38 19 7	0 29 15 11	0 53 16 3	1 59 20 1	2 23 20 5	○							
29	— —	0 4 19 10	1 18 16 7	1 42 16 10	2 48 20 9	3 12 21 0	16.7							
30	0 29 20 0	0 54 20 0	2 5 16 11	2 27 17 0	3 34 21 2	3 56 21 3	17.7							
31	1 19 20 0	1 43 19 10	2 50 16 11	3 12 16 11	4 19 21 3	4 43 21 2	18.7							
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				10ft. 1½in.				

Equation of Time at Noon.

D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
	3	58		9	7	31		17	10	29		25	12	41	
	4	26		10	7	55		18	10	48		26	12	53	
	4	54		11	8	19		19	11	7		27	13	5	
	5	21		12	8	42		20	11	24		28	13	17	
	5	48		13	9	5		21	11	41		29	13	27	
	6	14		14	9	27		22	11	57		30	13	37	
	6	40		15	9	48		23	12	12		31	13	45	
	7	6		16	10	9		24	12	27					

TIDE TABLES FOR THE

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
F.	1	2m28	1 30 11 9	1 53 11 9	8 12 21 6	8 36 21 5	5 2 14 10	5 26 14 8						
S.	2	3 25	2 17 11 8	2 42 11 6	9 0 21 2	9 25 20 10	5 50 14 5	6 16 14 4						
S.	3	4 19	3 7 11 5	3 32 11 3	9 50 20 5	10 15 19 11	6 43 13 10	7 10 13 8						
M.	4	5 11	3 57 11 1	4 21 10 10	10 41 19 6	11 10 19 0	7 37 13 3	8 4 12 1						
Tu.	5	6 2	4 46 10 8	5 13 10 6	11 41 18 6	— —	8 32 12 7	9 3 12 5						
W.	6	6 51	5 41 10 4	6 12 10 3	0 15 18 1	0 49 17 8	9 36 12 0	10 12 11 8						
Th.	7	7 41	6 47 10 2	7 27 10 2	1 22 17 5	1 54 17 4	10 46 11 8	11 20 11 6						
F.	8	8 31	8 3 10 2	8 38 10 3	2 27 17 4	3 0 17 7	11 53 11 9	— —						
S.	9	9 21	9 12 10 4	9 44 10 6	3 33 17 11	4 6 18 3	0 25 12 0	0 56 12 1						
S.	10	10 12	10 14 10 8	10 41 10 9	4 34 18 6	4 59 18 10	1 24 12 5	1 51 12 4						
M.	11	11 3	11 3 10 11	11 25 11 1	5 20 19 1	5 42 19 4	2 15 12 10	2 38 13 5						
Tu.	12	11 53	11 48 11 1	— —	6 4 19 6	6 27 19 7	3 0 13 3	3 21 13 3						
W.	13	0 42	0 11 11 2	0 32 11 2	6 49 19 8	7 8 19 9	3 41 13 5	4 0 13 5						
Th.	14	1 30	0 49 11 2	1 7 11 2	7 26 19 10	7 45 19 11	4 18 13 8	4 36 13 8						
F.	15	2 15	1 26 11 1	1 43 11 0	8 2 19 10	8 18 19 9	4 51 13 8	5 7 13 8						
S.	16	2 59	2 0 11 0	2 17 10 11	8 35 19 8	8 52 19 6	5 24 13 5	5 42 13 5						
S.	17	3 42	2 34 10 10	2 51 10 9	9 9 19 3	9 26 19 0	5 59 13 1	6 17 12 1						
M.	18	4 24	3 8 10 8	3 26 10 6	9 44 18 9	10 2 18 5	6 36 12 8	6 56 12 8						
Tu.	19	5 6	3 44 10 5	4 4 10 3	10 20 18 1	10 40 17 10	7 16 12 3	7 36 12 3						
W.	20	5 49	4 21 10 2	4 38 10 1	11 2 17 5	11 27 17 1	7 57 11 9	8 19 11 8						
Th.	21	6 34	4 59 9 11	5 22 9 10	11 54 16 9	— —	8 44 11 4	9 12 11 4						
F.	22	7 22	5 49 9 9	6 19 9 8	0 25 16 6	0 57 16 3	9 44 11 0	10 18 10 6						
S.	23	8 14	6 54 9 8	7 33 9 9	1 29 16 2	2 1 16 3	10 53 10 11	11 27 11 1						
S.	24	9 9	8 11 9 10	8 47 10 1	2 34 16 7	3 8 17 0	— —	0 1 11 0						
M.	25	10 7	9 22 10 3	9 53 10 6	3 43 17 8	4 15 18 3	0 34 11 9	1 5 12 8						
Tu.	26	11 8	10 23 10 10	10 51 11 1	4 43 18 11	5 9 19 6	1 34 12 8	2 2 13 8						
W.	27	morn.	11 18 11 4	11 42 11 7	5 34 20 1	5 58 20 7	2 29 13 7	2 54 14 7						
Th.	28	0 9	— —	0 6 11 10	6 23 21 0	6 49 21 6	3 17 14 4	3 41 14 4						
F.	29	1 9	0 32 12 0	0 55 12 1	7 14 21 10	7 38 22 2	4 5 15 1	4 28 15 1						
S.	30	2 7	1 19 12 1	1 42 12 1	8 1 22 3	8 23 23 3	4 50 15 5	5 13 15 5						
S.	31	3 3	2 5 12 1	2 28 12 0	8 46 22 3	9 9 21 11	5 36 15 3	5 59 15 3						

Half Mean Spring } 5ft. 9in.
Range.

10ft.

Phases of the Moon.

Mo

	D.	H.	M.	
Last Quarter -	5	6	22	Morning.
New - - -	12	6	53	Afternoon.
First Quarter -	21	0	26	Morning.
Full - - -	28	1	30	Morning.

M.D.	0	1
1	14	N. 48
2	10	58
3	6	31
4	1	47
5	28	56
6	7	26
7	11	28
8	14	52

In Apogee -	16	7	0	Afternoon.
In Perigee -	29	1	0	Morning.

The times of High Water are given for Mean Time at Place; if (
 HARWICH subtract 6 m. HULL add 1 m. SUNDERLAND add 1 m.

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
	1	5 5	13 6	5 30	13 5	3 59	16 7	4 24	16 6	10 14	13 6	10 39	13 3	18.4
	2	5 55	13 3	6 20	13 1	4 49	16 4	5 15	16 1	11 5	13 0	11 32	12 7	19.4
	3	6 46	12 10	7 12	12 6	5 41	15 10	6 8	15 5	12 0	12 3	—	—	20.4
	4	7 39	12 2	8 8	11 9	6 36	15 0	7 4	14 8	0 27	11 11	0 55	11 6	21.4
	5	8 38	11 4	9 11	11 0	7 33	14 3	8 6	13 11	1 24	11 2	1 56	10 10	(
	6	9 47	10 10	10 24	10 9	8 40	13 7	9 17	13 5	2 31	10 6	3 9	10 4	23.4
	7	10 58	10 8	11 32	10 9	9 53	13 4	10 27	13 4	3 50	10 3	4 26	10 2	24.4
	8	—	—	0 6	10 10	11 0	13 5	11 32	13 7	5 1	10 2	5 34	10 3	25.4
	9	0 39	10 11	1 8	11 1	—	—	0 3	13 9	6 4	10 5	6 31	10 9	26.4
	10	1 35	11 3	1 58	11 5	0 29	14 0	0 52	14 3	6 52	11 1	7 11	11 5	27.4
	11	2 19	11 8	2 40	11 11	1 14	14 7	1 36	14 10	7 30	11 9	7 49	12 1	28.4
	12	3 1	12 1	3 22	12 3	1 58	15 1	2 20	15 3	8 9	12 3	8 28	12 5	●
	13	3 42	12 4	4 0	12 6	2 41	15 5	2 58	15 6	8 46	12 6	9 3	12 6	0.7
	14	4 18	12 6	4 37	12 6	3 15	15 6	3 32	15 6	9 21	12 6	9 38	12 5	1.7
	15	4 54	12 5	5 11	12 3	3 49	15 5	4 6	15 3	9 55	12 3	10 13	12 2	2.7
	16	5 29	12 2	5 46	12 0	4 23	15 2	4 41	15 0	10 31	12 0	10 48	11 9	3.7
	17	6 3	11 11	6 21	11 9	4 58	14 10	5 15	14 8	11 6	11 6	11 26	11 3	4.7
	18	6 39	11 7	6 58	11 5	5 34	14 6	5 54	14 3	11 46	11 1	—	—	5.7
	19	7 17	11 3	7 38	11 0	6 14	14 0	6 35	13 9	0 6	10 10	0 26	10 7	6.7
	20	8 1	10 8	8 25	10 4	6 56	13 5	7 19	13 2	0 48	10 4	1 11	10 1	7.7
	21	8 51	10 1	9 21	9 11	7 45	12 11	8 15	12 8	1 36	9 10	2 6	9 7)
	22	9 55	9 10	10 30	9 10	8 48	12 6	9 23	12 6	2 40	9 6	3 16	9 5	9.7
	23	11 5	9 11	11 41	10 2	10 0	12 7	10 34	12 9	3 56	9 5	4 34	9 6	10.7
	24	—	—	0 15	10 5	11 8	13 0	11 41	13 4	5 9	9 9	5 43	10 0	11.7
	25	0 48	10 9	1 17	11 1	—	—	0 12	13 9	6 13	10 6	6 38	11 0	12.7
	26	1 43	11 6	2 9	11 11	0 37	14 3	1 3	14 10	7 2	11 8	7 24	12 3	13.7
	27	2 34	12 5	2 56	12 10	1 28	15 5	1 52	15 11	7 44	12 10	8 5	13 5	14.7
	28	3 18	13 3	3 42	13 8	2 15	16 5	2 40	16 10	8 28	13 10	8 51	14 1	○
	29	4 5	13 11	4 29	14 2	3 3	17 2	3 25	17 4	9 14	14 3	9 37	14 3	16.7
	30	4 52	14 2	5 16	14 1	3 48	17 4	4 11	17 3	10 1	14 3	10 24	14 1	17.7
	31	5 40	13 11	6 4	13 9	4 34	17 1	4 58	16 11	10 48	13 10	11 13	13 6	18.7
Half Mean Spring } Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

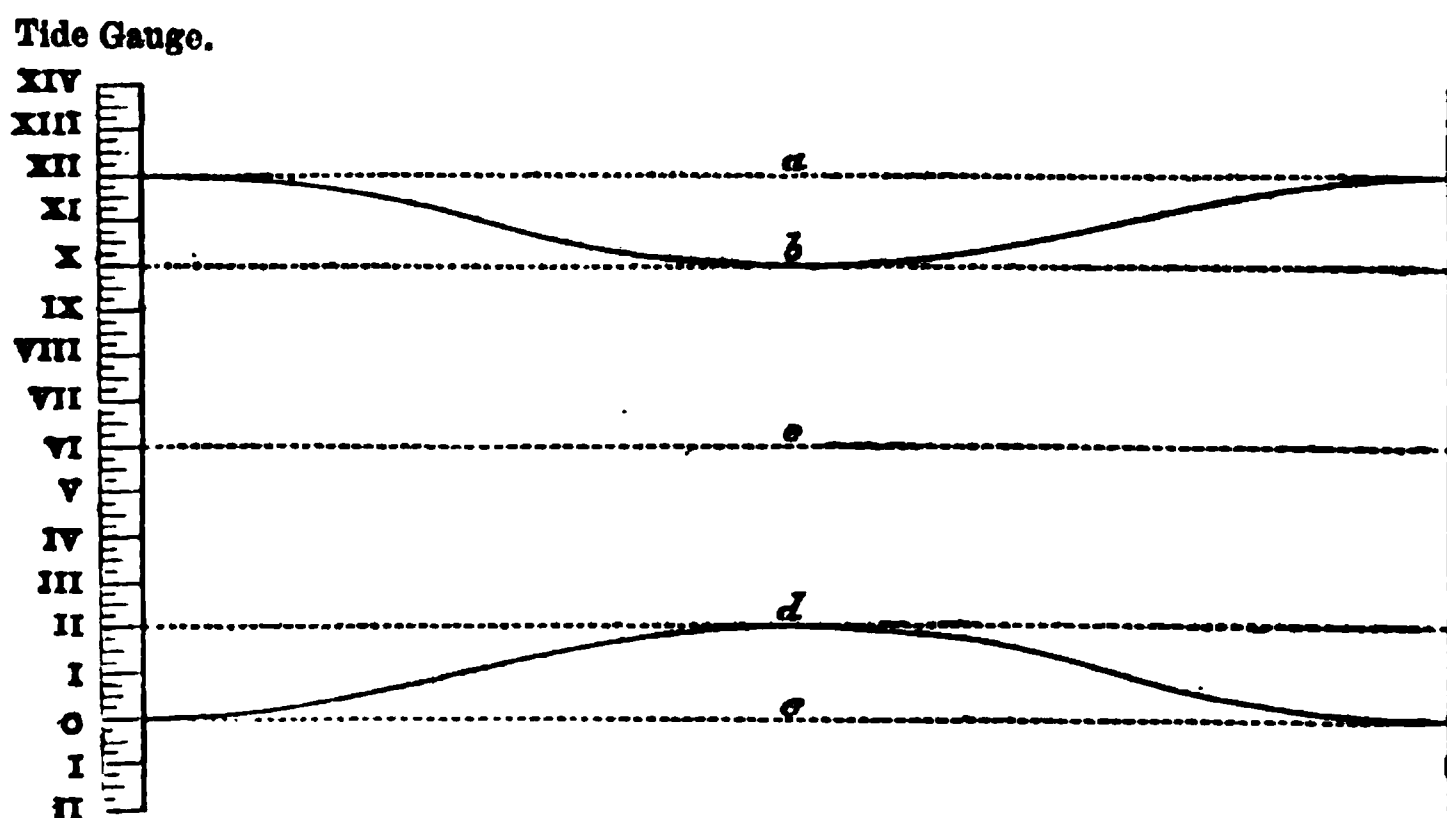
D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	58	Sub.	9	7	31	Sub.	17	10	29	Sub.	25	12	41	Sub.
2	4	26		10	7	55		18	10	48		26	12	53	
3	4	54		11	8	19		19	11	7		27	13	5	
4	5	21		12	8	42		20	11	24		28	13	17	
5	5	48		13	9	5		21	11	41		29	13	27	
6	6	14		14	9	27		22	11	57		30	13	37	
7	6	40		15	9	48		23	12	12		31	13	45	
8	7	6		16	10	9		24	12	27					

times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge, the latter being given in these tables, by applying to the times at the docks $+10^m$ and to the heights -5^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland, North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke, Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown, Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Mullaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Ducannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise, and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

Spring Rise (or Mean Spring Range)	=	e to a	=	12	ft.
Neap Rise	=	e to b	=	10	
Neap Range	=	d to b	=	8	

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1869.

TIDE TABLES FOR THE

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
F.	1	2m28	5 32 19 8	5 55 19 6	7 25 16 2	7 48 15 6	1 8 13 0	1 32 13 17						
S.	2	3 25	6 19 19 2	6 44 18 8	8 11 15 11	8 36 15 1	1 56 12 10	2 20 12 9						
S.	3	4 19	7 9 18 1	7 35 17 6	8 59 15 5	9 22 14 5	2 45 12 6	3 10 12 3						
M.	4	5 11	8 1 16 11	8 27 16 3	9 46 14 8	10 12 13 9	3 35 12 0	4 0 11 9						
Tu.	5	6 2	8 55 15 9	9 26 15 3	10 38 13 11	11 7 13 2	4 25 11 6	4 52 11 2						
W.	6	6 51	10 0 15 1	10 37 14 11	11 37 13 3	—	5 21 10 10	5 53 10 8						
Th.	7	7 41	11 14 14 9	11 53 14 11	0 13 12 11	0 50 13 1	6 27 10 7	7 3 10 6						
F.	8	8 31	—	0 28 15 1	1 25 13 0	2 1 13 3	7 40 10 8	8 17 10 10						
S.	9	9 21	1 1 15 4	1 31 15 9	2 35 13 4	3 7 13 6	8 52 11 0	9 23 11 2						
S.	10	10 12	1 56 16 2	2 19 16 7	3 37 13 10	4 4 14 0	9 50 11 5	10 14 11 7						
M.	11	11 3	2 41 17 0	3 3 17 4	4 29 14 4	4 53 14 3	10 36 11 8	10 59 11 10						
Tu.	12	11 53	3 25 17 8	3 46 17 9	5 16 14 9	5 37 14 6	11 21 11 11	11 42 12 0						
W.	13	0m42	4 5 17 10	4 23 17 11	5 57 15 0	6 16 14 6	—	0 1 12 0						
Th.	14	1 30	4 41 17 11	4 57 17 11	6 34 15 1	6 51 14 6	0 19 12 1	0 38 12 0						
F.	15	2 15	5 14 17 10	5 31 17 9	7 6 15 0	7 22 14 3	0 56 12 0	1 13 12 0						
S.	16	2 59	5 47 17 6	6 3 17 4	7 37 14 9	7 53 13 11	1 30 11 11	1 48 11 10						
S.	17	3 42	6 20 17 2	6 38 16 9	8 9 14 3	8 25 13 5	2 4 11 9	2 21 11 8						
M.	18	4 24	6 56 16 4	7 15 16 0	8 40 13 9	8 55 12 11	2 39 11 7	2 57 11 9						
Tu.	19	5 6	7 34 15 7	7 54 15 11	9 11 13 2	9 30 12 7	3 15 11 3	3 33 11 1						
W.	20	5 49	8 14 14 8	8 36 14 3	9 51 12 8	10 13 12 2	3 52 10 11	4 12 10 8						
Th.	21	6 34	9 3 13 11	9 33 13 9	10 37 12 3	11 3 12 0	4 34 10 6	4 59 10 3						
F.	22	7 22	10 6 13 8	10 43 13 9	11 34 12 0	—	5 27 10 1	5 59 10 0						
S.	23	8 14	11 23 13 11	—	0 8 12 1	0 47 12 2	6 34 10 0	7 11 10 1						
S.	24	9 9	0 1 14 11	0 38 14 9	1 27 12 6	2 5 12 9	7 48 10 4	8 26 10 8						
M.	25	10 7	1 10 15 5	1 40 16 2	2 42 13 2	3 16 13 6	9 1 11 0	9 32 11 5						
Tu.	26	11 8	2 8 16 11	2 34 17 9	3 48 14 3	4 17 14 4	10 1 11 9	10 29 12 1						
W.	27	morn.	2 56 18 7	3 20 19 3	4 45 15 1	5 12 15 0	10 52 12 5	11 16 12 9						
Th.	28	0 9	3 45 19 10	4 9 20 11	5 38 15 10	6 4 15 7	11 41 13 0	—						
F.	29	1 9	4 33 20 6	4 56 20 8	6 30 16 5	6 55 16 1	0 5 13 3	0 30 13 4						
S.	30	2 7	5 19 20 8	5 42 20 7	7 17 16 8	7 40 15 11	0 55 13 5	1 19 13 5						
S.	31	3 3	6 4 20 4	6 27 19 11	8 3 16 6	8 26 15 8	1 42 13 5	2 5 13 3						
Half Mean Spring Range.			9 ⁿ . 6 ⁱⁿ .				7 ⁿ . 9 ⁱⁿ .				6 ⁿ . 4 ⁱⁿ .			
Phases of the Moon.							Moon's Declination at Noon.							
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°
Last Quarter -			5	6	22	Morning.	1	14	N. 48	9	17	S. 28	17	7 S. 0
New - - - -			12	6	53	Afternoon.	2	10	58	10	19	10	18	3 6
First Quarter -			21	0	26	Morning.	3	6	31	11	19	54	19	0 N. 57
Full - - - -			28	1	30	Morning.	4	1	47	12	19	40	20	5 1
							5	28	56	13	18	30	21	8 57
In Perigee - -			16	7	0	Afternoon.	6	7	26	14	16	31	22	12 37
In Apogee - -			29	1	0	Morning.	7	11	28	15	13	51	23	15 46
							8	14	52	16	10	37	24	18 12

The times of High Water are given for Mean Time at Place; if Greenwich or Rail

Brest add 18 m.

|

Devonport add 17 m.

|

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								ONDON.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.										
F.	1	0 42	19 4	1 9	19 3	2 16	16 6	2 39	16 6	3 46	20 8	4 10	20 8	18.4												
S.	2	1 35	19 2	2 0	19 0	3 2	16 5	3 25	16 3	4 32	20 7	4 56	20 6	19.4												
S.	3	2 26	18 8	2 51	18 3	3 49	16 0	4 14	15 9	5 20	20 4	5 46	20 0	20.4												
M.	4	3 16	17 10	3 41	17 4	4 39	15 5	5 5	15 1	6 11	19 6	6 36	19 1	21.4												
Tu.	5	4 6	16 10	4 31	16 4	5 32	14 9	6 0	14 5	7 2	18 8	7 31	18 3	22.4												
W.	6	4 58	15 10	5 27	15 6	6 31	14 1	7 5	13 10	8 1	17 10	8 34	17 6	23.4												
Th.	7	5 57	15 4	6 30	15 3	7 41	13 9	8 19	13 9	9 9	17 4	9 44	17 4	24.4												
F.	8	7 6	15 5	7 43	15 8	8 55	13 10	9 31	14 0	10 20	17 6	10 56	17 8	25.4												
S.	9	8 17	15 11	8 46	16 2	10 5	14 2	10 37	14 4	11 31	17 11	—	—	26.4												
S.	10	9 13	16 5	9 37	19 9	11 5	14 6	11 30	14 9	0 4	18 2	0 32	18 5	27.4												
M.	11	10 1	17 0	10 25	17 3	11 52	14 11	—	—	0 59	18 9	1 23	19 0	28.4												
Tu.	12	10 49	17 5	11 11	17 6	0 13	15 1	0 35	15 3	1 47	19 2	2 8	19 3	29.4												
W.	13	11 32	17 7	11 52	17 8	0 57	15 4	1 19	15 5	2 29	19 4	2 48	19 5	30.7												
Th.	14	—	—	0 12	17 9	1 37	15 6	1 55	15 6	3 7	19 6	3 24	19 6	31.7												
F.	15	0 30	17 9	0 49	17 9	2 12	15 5	2 28	15 5	3 42	19 6	3 58	19 6	32.7												
S.	16	1 8	17 8	1 26	17 6	2 44	15 4	3 1	15 3	4 14	19 5	4 31	19 5	33.7												
S.	17	1 43	17 5	2 1	17 4	3 17	15 2	3 33	15 0	4 48	19 4	5 6	19 3	34.7												
M.	18	2 19	17 1	2 38	16 9	3 50	14 10	4 8	14 8	5 23	19 1	5 39	18 10	35.7												
Tu.	19	2 57	16 6	3 15	16 3	4 26	14 5	4 45	14 3	5 56	18 6	6 14	18 2	36.7												
W.	20	3 33	15 11	3 53	15 3	5 4	14 0	5 24	13 9	6 33	17 10	6 53	17 6	37.7												
Th.	21	4 14	15 3	4 38	14 10	5 47	13 7	6 12	13 4	7 15	17 3	7 40	17 0	38.7												
F.	22	5 4	14 6	5 33	14 4	6 40	13 1	7 13	13 0	8 9	16 8	8 42	16 6	39.7												
S.	23	6 4	14 4	6 38	14 6	7 48	13 0	8 25	13 1	9 17	16 6	9 53	16 8	40.7												
S.	24	7 14	14 11	7 52	15 5	9 3	13 4	9 40	13 8	10 29	16 11	11 5	17 3	41.7												
M.	25	8 26	15 11	8 55	16 6	10 15	14 0	10 46	14 4	11 40	17 8	—	—	42.7												
Tu.	26	9 24	17 1	9 52	17 8	11 14	14 9	11 41	15 2	0 13	18 2	0 43	18 8	43.7												
W.	27	10 18	18 3	10 44	18 9	—	—	0 6	15 6	1 9	19 3	1 34	19 8	44.7												
Th.	28	11 11	19 3	11 38	19 7	0 29	15 11	0 53	16 3	1 59	20 1	2 23	20 5	45.7												
F.	29	—	—	0 4	19 10	1 18	16 7	1 42	16 10	2 48	20 9	3 12	21 0	46.7												
S.	30	0 29	20 0	0 54	20 0	2 5	16 11	2 27	17 0	3 34	21 2	3 56	21 3	47.7												
S.	31	1 19	20 0	1 43	19 10	2 50	16 11	3 12	16 11	4 19	21 3	4 43	21 2	48.7												
Half Mean Spring Range.		9ft. 4in.								8ft. 0in.								10ft. 1½in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	58	Sub.	9	7	31	Sub.	17	10	29	Sub.	25	12	41	Sub.
2	4	26		10	7	55		18	10	48		26	12	53	
3	4	54		11	8	19		19	11	7		27	13	5	
4	5	21		12	8	42		20	11	24		28	13	17	
5	5	48		13	9	5		21	11	41		29	13	27	
6	6	14		14	9	27		22	11	57		30	13	37	
7	6	40		15	9	48		23	12	12		31	13	45	
8	7	6		16	10	9		24	12	27					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		H. M.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
F.	1	2m28	1 30 11 9	1 53 11 9	8 12 21 6	8 36 21 5	5 2 14 10	5 26 14 8						
S.	2	3 25	2 17 11 8	2 43 11 6	9 0 21 2	9 25 20 10	5 50 14 5	6 16 14 2						
M.	3	4 19	3 7 11 5	3 32 11 3	9 50 20 5	10 15 19 11	6 43 13 10	7 10 13 7						
Tu.	4	5 11	3 57 11 1	4 21 10 10	10 41 19 6	11 10 19 0	7 37 13 3	8 4 12 11						
W.	5	6 2	4 46 10 8	5 13 10 6	11 41 18 6	— —	8 32 12 7	9 3 12 5						
Th.	6	6 51	5 41 10 4	6 12 10 3	0 15 18 1	0 49 17 8	9 36 12 0	10 12 11 9						
F.	7	7 41	6 47 10 2	7 27 10 2	1 22 17 5	1 54 17 4	10 46 11 8	11 20 11 8						
S.	8	8 31	8 3 10 1	8 38 10 3	2 27 17 4	3 0 17 7	11 53 11 9	— —						
M.	9	9 21	9 12 10 4	9 44 10 6	3 33 17 11	4 6 18 3	0 25 12 0	0 56 12 3						
Tu.	10	10 12	10 14 10 8	10 41 10 9	4 34 18 6	4 59 18 10	1 24 12 5	1 51 12 9						
W.	11	11 3	11 3 10 11	11 25 11 1	5 20 19 1	5 42 19 4	2 15 12 10	2 38 13 1						
Th.	12	11 53	11 48 11 1	— —	6 4 19 6	6 27 19 7	3 0 13 3	3 21 13 4						
F.	13	0 42	0 11 11 2	0 32 11 2	6 49 19 8	7 8 19 9	3 41 13 5	4 0 15 7						
S.	14	1 30	0 49 11 2	1 7 11 2	7 26 19 10	7 45 19 11	4 18 13 8	4 36 13 9						
M.	15	2 15	1 26 11 1	1 43 11 0	8 2 19 10	8 18 19 9	4 51 13 8	5 7 13 7						
Tu.	16	2 59	2 0 11 0	2 17 10 11	8 35 19 8	8 52 19 6	5 24 13 5	5 41 13 3						
W.	17	3 42	2 34 10 10	2 51 10 9	9 9 19 3	9 26 19 0	5 59 13 1	6 17 13 11						
Th.	18	4 24	3 8 10 8	3 26 10 6	9 44 18 9	10 2 18 5	6 36 12 8	6 56 12 5						
F.	19	5 6	3 44 10 5	4 4 10 3	10 20 18 1	10 40 17 10	7 16 12 3	7 36 12 0						
S.	20	5 49	4 21 10 2	4 38 10 1	11 2 17 5	11 27 17 1	7 57 11 9	8 19 11 7						
M.	21	6 34	4 59 9 11	5 22 9 10	11 54 16 9	— —	8 44 11 4	9 12 11 2						
Tu.	22	7 22	5 49 9 9	6 19 9 8	0 25 16 6	0 57 16 3	9 44 11 0	10 18 10 11						
W.	23	8 14	6 54 9 8	7 33 9 9	1 29 16 2	2 1 16 3	10 53 10 11	11 27 11 1						
Th.	24	9 9	8 11 9 10	8 47 10 1	2 34 16 7	3 8 17 0	— —	0 1 11 5						
F.	25	10 7	9 22 10 1	9 53 10 6	3 43 17 8	4 15 18 3	0 34 11 9	1 5 12 3						
S.	26	11 8	10 23 10 10	10 51 11 1	4 43 18 11	5 9 19 6	1 34 12 8	2 2 13 2						
M.	27	morn.	11 18 11 4	11 42 11 7	5 34 20 1	5 58 20 7	2 29 13 7	2 54 14 0						
Tu.	28	0 9	— —	0 6 11 10	6 23 21 0	6 49 21 6	3 17 14 4	3 41 14 9						
W.	29	1 9	0 32 12 0	0 55 12 1	7 14 21 10	7 38 22 2	4 5 15 1	4 28 15 4						
Th.	30	2 7	1 19 12 1	1 42 12 1	8 1 22 3	8 23 22 3	4 50 15 5	5 13 15 4						
F.	31	3 3	2 5 12 1	2 28 12 0	8 46 22 3	9 9 21 11	5 36 15 3	5 59 15 0						

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter-	5	6	22	Morning.
New - - -	12	6	53	Afternoon.
First Quarter-	21	0	26	Morning.
Full - - -	28	1	30	Morning.
In Apogee -	16	7	0	Afternoon.
In Perigee -	29	1	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	14	N. 48	9	17	S. 28	17	7	S. 0	25	19	N. 38
2	10	58	10	19	10	18	3	6	26	19	50
3	6	31	11	19	54	19	0	N. 57	27	18	41
4	1	47	12	19	40	20	5	1	28	16	12
5	28	56	13	18	30	21	8	57	29	12	38
6	7	26	14	16	31	22	12	37	30	8	15
7	11	28	15	13	51	23	15	46	31	3	23
8	14	52	16	10	37	24	18	12			

The times of High Water are given for Mean Time at Place; if Greenwich or Rail

HARWICH subtract 5 m.

HULL add 1 m.

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.
M.	1	2	8	19	6	2	33	19	2	3	34	16	9	3	57	16	5	5	6	21	1	5	30	20	10	19.7
Tu.	2	2	56	18	8	3	19	18	1	4	21	16	2	4	45	15	9	5	52	20	5	6	15	19	11	20.7
W.	3	3	41	17	6	4	5	16	10	5	8	15	3	5	32	14	10	6	39	19	3	7	4	18	9	21.7
Th.	4	4	30	16	2	4	55	15	6	5	58	14	5	6	28	14	0	7	29	18	2	7	56	17	8	22.7
F.	5	5	23	15	0	5	54	14	8	7	0	13	7	7	35	13	4	8	27	17	2	9	4	16	11	23.7
S.	6	6	30	14	5	7	8	14	6	8	13	13	3	8	54	13	3	9	43	16	9	10	22	16	10	24.7
S.	7	7	49	14	9	8	25	15	1	9	33	13	4	10	11	13	6	11	2	17	0	11	40	17	3	25.7
M.	8	8	57	15	5	9	24	15	10	10	46	13	9	11	16	14	0	—	—	—	0	15	17	6	26.7	
Tu.	9	9	49	16	2	10	12	16	7	11	43	14	3	—	—	—	0	45	17	10	1	10	18	3	27.7	
W.	10	10	33	16	11	10	53	17	3	0	4	14	6	0	25	14	9	1	34	18	7	1	56	18	10	28.7
Th.	11	11	12	17	6	11	32	17	8	0	44	15	0	1	2	15	2	2	16	19	1	2	35	19	3	29.7
F.	12	11	50	17	10	—	—	—	—	1	20	15	4	1	37	15	6	2	52	19	5	3	8	19	7	30.7
S.	13	0	8	17	11	0	26	18	0	1	53	15	7	2	9	15	7	3	24	19	8	3	40	19	9	31.7
S.	14	0	43	18	1	1	0	18	1	2	25	15	8	2	41	15	7	3	55	19	9	4	10	19	9	32.7
M.	15	1	17	18	0	1	33	17	11	2	56	15	7	3	9	15	6	4	25	19	9	4	41	19	8	33.7
Tu.	16	1	49	17	10	2	6	17	8	3	23	15	5	3	39	15	3	4	55	19	7	5	11	19	6	34.7
W.	17	2	23	17	5	2	41	17	1	3	55	15	1	4	12	14	11	5	27	19	4	5	43	19	1	35.7
Th.	18	3	0	16	9	3	18	16	4	4	29	14	8	4	48	14	5	6	0	18	9	6	19	18	4	36.7
F.	19	3	37	15	11	3	58	15	6	5	8	14	1	5	29	13	9	6	37	17	11	6	57	17	6	37.7
S.	20	4	21	15	0	4	48	14	7	5	53	13	6	6	20	13	3	7	21	17	2	7	48	16	10	38.7
S.	21	5	21	14	4	5	55	14	3	6	54	13	0	7	33	12	11	8	22	16	6	9	0	16	5	39.7
M.	22	6	32	14	5	7	14	14	9	8	15	13	0	8	57	13	2	9	41	16	6	10	24	16	9	40.7
Tu.	23	7	56	15	4	8	34	16	1	9	39	13	6	10	18	13	11	11	8	17	2	11	48	17	8	41.7
W.	24	9	5	16	10	9	34	17	7	10	53	14	5	11	24	14	11	—	—	—	0	22	18	3	42.7	
Th.	25	10	2	18	3	10	28	18	11	11	50	15	5	—	—	—	0	51	18	11	1	18	19	7	43.7	
F.	26	10	54	19	6	11	20	19	11	0	15	15	11	0	39	16	5	1	44	20	2	2	7	20	7	44.7
S.	27	11	45	20	3	—	—	—	—	1	2	16	9	1	26	17	1	2	30	21	0	2	54	21	3	45.7
S.	28	0	10	20	6	0	34	20	7	1	49	17	4	2	11	17	5	3	18	21	6	3	40	21	8	46.7
Half Mean Spring Range.		9ft. 4in.								8ft. 0in.								10ft. 1½in.								

Equation of Time at Noon.

M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	13	53	Sub.	9	14	29	Sub.	17	14	14	Sub.	25	13	14	Sub.
2	14	1		10	14	29		18	14	9		26	13	4	
3	14	7		11	14	30		19	14	3		27	12	53	
4	14	13		12	14	29		20	13	57		28	12	42	
5	14	17		13	14	27		21	13	50					
6	14	21		14	14	25		22	13	42					
7	14	25		15	14	22		23	13	33					
8	14	27		16	14	19		24	13	24					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	2 m 28	1 34	10 0	1 58	10 0	0 45	26 10	1 9	26 8	7 58	21 7	8 22	21 4
S.	2	3 25	2 21	9 11	2 45	9 10	1 32	26 4	1 56	25 11	8 47	21 1	9 12	20 7
S.	3	4 19	3 10	9 9	3 34	9 7	2 20	25 5	2 45	24 10	9 36	20 1	9 59	19 7
M.	4	5 11	3 58	9 6	4 23	9 4	3 10	24 3	3 35	23 7	10 22	19 0	10 45	18 3
Tu.	5	6 2	4 49	9 2	5 16	9 0	4 1	22 11	4 31	22 4	11 8	17 9	11 33	17 2
W.	6	6 51	5 46	8 10	6 19	8 8	5 4	21 9	5 41	21 6	—	—	0 2	16 10
Th.	7	7 41	6 53	8 7	7 28	8 6	6 20	21 4	6 58	21 4	0 34	16 8	1 11	16 6
F.	8	8 31	8 5	8 6	8 40	8 7	7 34	21 7	8 9	21 11	1 53	16 7	2 32	16 13
S.	9	9 21	9 14	8 9	9 44	8 10	8 40	22 3	9 8	22 7	3 8	17 3	3 40	17 8
S.	10	10 12	10 10	8 11	10 34	9 0	9 32	23 0	9 54	23 5	4 9	18 1	4 35	18 6
M.	11	11 3	10 58	9 1	11 22	9 1	10 15	23 9	10 37	24 0	5 0	18 10	5 26	19 1
Tu.	12	11 53	11 46	9 2	—	—	10 59	24 2	11 20	24 4	5 50	19 4	6 12	19 4
W.	13	0 a 42	0 8	9 3	0 28	9 3	11 40	24 7	11 59	24 8	6 31	19 8	6 49	19 13
Th.	14	1 30	0 47	9 4	1 6	9 4	—	—	0 17	24 9	7 7	19 10	7 24	19 13
F.	15	2 15	1 23	9 5	1 40	9 4	0 33	24 8	0 50	24 7	7 40	19 9	7 57	19 8
S.	16	2 59	1 57	9 4	2 14	9 4	1 7	24 6	1 24	24 3	8 14	19 5	8 31	19 3
S.	17	3 42	2 29	9 4	2 46	9 3	1 40	23 11	1 57	23 8	8 48	19 0	9 6	18 8
M.	18	4 24	3 4	9 2	3 21	9 1	2 14	23 3	2 32	22 10	9 23	18 4	9 40	18 0
Tu.	19	5 6	3 39	9 0	3 57	8 11	2 50	22 6	3 8	22 2	9 57	17 8	10 15	17 3
W.	20	5 49	4 16	8 10	4 36	8 8	3 27	21 8	3 48	21 2	10 33	16 11	10 52	16 3
Th.	21	6 34	4 58	8 7	5 24	8 5	4 11	20 9	4 40	20 3	11 14	15 11	11 40	15 7
F.	22	7 22	5 53	8 4	6 25	8 3	5 12	20 0	5 47	19 11	—	—	0 9	15 3
S.	23	8 14	7 0	8 2	7 37	8 3	6 27	20 1	7 7	20 5	0 42	15 6	1 20	15 8
S.	24	9 9	8 14	8 4	8 50	8 6	7 43	20 10	8 18	21 6	2 1	16 0	2 41	16 6
M.	25	10 7	9 23	8 9	9 53	8 11	8 49	22 3	9 16	23 1	3 18	17 3	3 50	18 1
Tu.	26	11 8	10 22	9 2	10 49	9 4	9 42	23 11	10 7	24 8	4 21	18 10	4 50	19 7
W.	27	morn.	11 15	9 6	11 41	9 8	10 30	25 5	10 54	26 1	5 18	20 4	5 45	21 0
Th.	28	0 9	—	—	0 7	9 10	11 19	26 8	11 45	27 3	6 11	21 7	6 30	22 1
F.	29	1 9	0 33	10 0	0 58	10 2	—	—	0 9	27 7	7 1	22 6	7 24	22 3
S.	30	2 7	1 22	10 3	1 45	10 3	0 32	27 10	0 56	27 10	7 46	22 7	8 8	22 6
S.	31	3 3	2 8	10 3	2 30	10 2	1 19	27 9	1 41	27 4	8 31	22 2	8 55	21 9
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	5	6	22	Morning.
New - - - - -	12	6	53	Afternoon.
First Quarter -	21	0	26	Morning.
Full - - - - -	28	1	30	Morning.
<hr/>				
In Apogee - -	16	7	0	Afternoon.
In Perigee - -	29	1	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	14	N.48	9	17	S.28	17	7	S. 0	25	19	S.33
2	10	58	10	19	10	18	3	6	26	19	50
3	6	31	11	19	54	19	0	N.57	27	18	41
4	1	47	12	19	40	20	5	1	28	16	13
5	2	S.56	13	18	30	21	8	57	29	13	38
6	7	26	14	16	31	22	12	37	30	8	13
7	11	28	15	13	51	23	15	46	31	3	33
8	14	52	16	10	37	24	18	12			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 29 m.

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	D.	
F.	1	8 41 38 5	9 3 38 2	11 54 16 4	— —	0 33 11 2	0 58 11 1	18° 4						
S.	2	9 26 37 9	9 48 37 1	0 20 16 2	0 47 15 11	1 23 10 11	1 49 10 9	19° 4						
S.	3	10 9 36 2	10 30 35 4	1 15 15 8	1 42 15 3	2 15 10 7	2 42 10 5	20° 4						
M.	4	10 50 34 4	11 12 33 4	2 9 14 11	2 36 14 7	3 8 10 2	3 35 10 0	21° 4						
Tu.	5	11 37 32 4	— —	3 5 14 3	3 37 13 11	4 3 9 10	4 36 9 7	22° 4						
W.	6	0 6 31 5	0 38 30 10	4 12 13 7	4 50 13 6	5 10 9 5	5 43 9 3	23° 4						
Th.	7	1 13 30 6	1 49 30 3	5 26 13 5	6 1 13 5	6 15 9 3	6 48 9 4	24° 4						
F.	8	2 26 30 5	3 4 30 8	6 34 13 6	7 6 13 8	7 21 9 5	7 53 9 6	25° 4						
S.	9	3 42 31 1	4 17 31 8	7 36 13 10	8 4 14 0	8 26 9 7	8 56 9 9	26° 4						
S.	10	4 48 32 4	5 15 33 0	8 28 14 3	8 49 14 6	9 24 9 10	9 48 10 0	27° 4						
M.	11	5 41 33 7	6 7 34 2	9 10 14 8	9 31 14 10	10 10 10 1	10 30 10 3	28° 4						
Tu.	12	6 32 34 6	6 54 34 9	9 53 15 0	10 14 15 1	10 51 10 4	11 10 10 5	29° 4						
W.	13	7 14 35 0	7 33 35 3	10 31 15 2	10 47 15 2	11 28 10 6	11 46 10 6	30° 4						
Th.	14	7 51 35 5	8 7 35 5	11 3 15 2	11 19 15 2	— —	0 4 10 6	1° 7						
F.	15	8 23 35 3	8 40 35 2	11 36 15 1	11 54 15 0	0 22 10 5	0 39 10 5	2° 7						
S.	16	8 56 35 0	9 11 34 9	— —	0 12 14 11	0 57 10 4	1 15 10 3	3° 7						
S.	17	9 26 34 5	9 42 33 11	0 30 14 9	0 49 14 7	1 32 10 1	1 50 10 0	4° 7						
M.	18	9 58 33 4	10 13 32 10	1 8 14 4	1 28 14 1	2 9 9 10	2 28 9 9	5° 7						
Tu.	19	10 27 32 3	10 43 31 4	1 48 13 10	2 8 13 8	2 47 9 7	3 7 9 6	6° 7						
W.	20	11 0 30 9	11 19 30 0	2 29 13 5	2 52 13 1	3 28 9 4	3 50 9 3	7° 7						
Th.	21	11 44 29 4	— —	3 17 12 11	3 47 12 8	4 15 9 1	4 45 8 11	8° 7						
F.	22	0 13 28 10	0 45 28 6	4 21 12 6	4 56 12 6	5 17 8 10	5 49 8 9	9° 7						
S.	23	1 20 28 7	1 58 28 10	5 33 12 8	6 8 12 10	6 22 8 10	6 55 9 0	10° 7						
S.	24	2 36 29 5	3 14 30 2	6 42 13 1	7 15 13 5	7 29 9 2	8 2 9 5	11° 7						
M.	25	3 52 31 2	4 27 32 4	7 45 13 10	8 12 14 3	8 34 9 8	9 5 9 11	12° 7						
Tu.	26	5 0 33 7	5 31 34 11	8 38 14 9	9 3 15 3	9 35 10 2	10 2 10 5	13° 7						
W.	27	5 59 36 2	6 26 37 2	9 26 15 8	9 49 16 1	10 25 10 9	10 46 11 0	14° 7						
Th.	28	6 53 38 1	7 19 38 11	10 14 16 6	10 36 16 9	11 9 11 3	11 33 11 5	15° 7						
F.	29	7 43 39 8	8 6 39 11	10 57 17 0	11 18 17 1	11 57 11 6	— —	16° 7						
S.	30	8 29 39 11	8 51 39 11	11 41 17 1	— —	0 21 11 6	0 45 11 6	17° 7						
S.	31	9 12 39 6	9 34 38 11	0 5 17 0	0 29 16 9	1 8 11 5	1 32 11 3	18° 7						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	58	Sub.	9	7	31	Sub.	17	10	29	Sub.	25	12	41	Sub.
2	4	26		10	7	55		18	10	48		26	12	53	
3	4	54		11	8	19		19	11	7		27	13	5	
4	5	21		12	8	42		20	11	24		28	13	17	
5	5	48		13	9	5		21	11	41		29	13	27	
6	6	14		14	9	27		22	11	57		30	13	37	
7	6	40		15	9	48		23	12	12		31	13	45	
8	7	6		16	10	9		24	12	27					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	2m28	0 8	9 7	0 34	9 7	9 42	7 9	10 5	7 7	7 3	11 4	7 27	11 1
S.	2	3 25	1 0	9 6	1 26	9 5	10 28	7 5	10 53	7 3	7 52	10 10	8 17	10 6
S.	3	4 19	1 54	9 4	2 23	9 2	11 21	7 0	11 53	6 9	8 43	10 3	9 11	9 11
M.	4	5 11	2 51	9 1	3 19	8 11	—	—	0 28	6 6	9 41	9 8	10 12	9 5
Tu.	5	6 2	3 48	8 9	4 18	8 7	1 4	6 3	1 43	6 2	10 46	9 3	11 22	9 1
W.	6	6 51	4 51	8 6	5 24	8 5	2 24	6 1	3 1	6 2	11 56	9 0	—	—
Th.	7	7 41	5 57	8 4	6 30	8 3	3 34	6 3	4 4	6 4	0 30	8 11	1 4	8 11
F.	8	8 31	7 5	8 3	7 40	8 4	4 34	6 5	5 1	6 6	1 40	8 11	2 12	9 1
S.	9	9 21	8 12	8 5	8 38	8 7	5 26	6 7	5 50	6 8	2 43	9 3	3 9	9 5
S.	10	10 12	9 2	8 9	9 24	8 10	6 12	6 9	6 34	6 11	3 32	9 8	3 51	9 11
M.	11	11 3	9 45	9 0	10 7	9 1	6 56	7 0	7 19	7 1	4 11	10 1	4 33	10 3
Tu.	12	11 53	10 28	9 1	10 49	9 2	7 42	7 2	8 4	7 2	4 55	10 5	5 17	10 6
W.	13	0a42	11 7	9 2	11 25	9 2	8 22	7 3	8 38	7 3	5 37	10 7	5 55	10 8
Th.	14	1 30	11 42	9 2	11 57	9 1	8 54	7 3	9 9	7 2	6 12	10 8	6 27	10 7
F.	15	2 15	—	—	0 14	9 1	9 25	7 1	9 41	7 0	6 44	10 6	7 2	10 4
S.	16	2 59	0 32	9 1	0 50	9 0	9 57	6 11	10 13	6 10	7 19	10 2	7 36	10 6
S.	17	3 42	1 8	9 0	1 27	8 11	10 29	6 8	10 47	6 7	7 53	9 9	8 11	9 7
M.	18	4 24	1 47	8 10	2 8	8 9	11 6	6 5	11 28	6 3	8 29	9 4	8 48	9 2
Tu.	19	5 6	2 29	8 8	2 50	8 7	11 53	6 1	—	—	9 9	9 0	9 33	8 13
W.	20	5 49	3 11	8 5	3 34	8 4	0 19	5 10	0 49	5 8	9 58	8 7	10 25	8 6
Th.	21	6 34	3 59	8 3	4 27	8 2	1 20	5 7	1 55	5 6	10 56	8 4	11 30	8 3
F.	22	7 22	4 58	8 1	5 30	8 0	2 33	5 6	3 8	5 8	—	—	0 4	8 3
S.	23	8 14	6 4	8 0	6 39	8 1	3 41	5 10	4 13	6 0	0 38	8 4	1 13	8 6
S.	24	9 9	7 14	8 2	7 49	8 3	4 42	6 3	5 10	6 5	1 48	8 8	2 22	8 11
M.	25	10 7	8 20	8 5	8 46	8 8	5 35	6 8	5 58	6 10	2 52	9 3	3 17	9 8
Tu.	26	11 8	9 12	8 11	9 37	9 2	6 23	7 1	6 49	7 4	3 42	10 1	4 5	10 6
W.	27	morn.	10 1	9 4	10 24	9 6	7 13	7 7	7 38	7 9	4 28	10 10	4 51	11 3
Th.	28	0 9	10 48	9 8	11 12	9 9	8 3	8 0	8 26	8 2	5 17	11 7	5 42	11 10
F.	29	1 9	11 35	9 10	11 57	9 10	8 48	8 3	9 9	8 3	6 5	12 0	6 27	12 0
S.	30	2 7	—	—	0 20	9 10	9 30	8 2	9 52	8 1	6 50	11 11	7 13	11 9
S.	31	3 3	0 44	9 10	1 8	9 9	10 14	7 11	10 36	7 9	7 36	11 6	8 0	11 2

Half Mean Spring }
Range. } 4ft. 9in.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H. M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Last Quarter -	5	6 22	Morning.	1	14	N.48		9	17	S.28		17	7	S.0		25	19	N.38
New - - - - -	12	6 53	Afternoon.	2	10	58		10	19	10		18	3	6		26	19	50
First Quarter -	21	0 26	Morning.	3	6	31		11	19	54		19	0	N.57		27	18	41
Full - - - - -	28	1 30	Morning.	4	1	47		12	19	40		20	5	1		28	16	13
				5	2	S.56		13	18	30		21	8	57		29	12	38
In Apogee - -	16	7 0	Afternoon.	6	7	26		14	16	31		22	12	37		30	8	15
In Perigee - -	29	1 0	Morning.	7	11	28		15	13	51		23	15	46		31	3	25
				8	14	52		16	10	37		24	18	12				

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for
BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

JANUARY, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.	
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.		
		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		D.	
F.	1	6 24 15 3		6 29 15 1		6 50 12 1		7 14 11 11		7 11 12 10		7 35 12 9		18.4	
S.	2	7 14 14 9		7 40 14 5		7 38 11 9		8 3 11 6		7 59 12 8		8 22 12 6		19.4	
S.	3	8 6 14 1		8 33 13 7		8 27 11 3		8 50 11 0		8 45 12 3		9 7 12 0		20.4	
M.	4	9 0 13 1		9 27 12 7		9 13 10 9		9 37 10 5		9 29 11 9		9 52 11 5		21.4	
Tu.	5	9 57 12 3		10 30 11 11		10 2 10 2		10 30 9 11		10 20 11 2		10 52 10 10		(
W.	6	11 5 11 9		11 42 11 8		11 4 9 9		11 39 9 8		11 24 10 7		11 56 10 5		23.4	
Th.	7	— —		0 17 11 8		— —		0 15 9 7		— —		0 28 10 4		24.4	
F.	8	0 51 11 9		1 24 11 11		0 51 9 8		1 28 9 9		1 2 10 5		1 37 10 6		25.4	
S.	9	1 54 12 2		2 21 12 5		2 4 9 11		2 36 10 1		2 13 10 8		2 47 10 10		26.4	
S.	10	2 46 12 7		3 10 12 11		3 3 10 3		3 28 10 5		3 18 11 0		3 44 11 2		27.4	
M.	11	3 32 13 2		3 54 13 4		3 52 10 7		4 16 10 9		4 10 11 4		4 36 11 6		28.4	
Tu.	12	4 16 13 6		4 37 13 8		4 39 10 11		5 0 11 0		5 1 11 7		5 23 11 8		●	
W.	13	4 54 13 10		5 12 13 11		5 20 11 1		5 39 11 2		5 42 11 9		6 0 11 10		0.7	
Th.	14	5 31 14 0		5 48 13 11		5 58 11 2		6 15 11 2		6 19 11 10		6 36 11 10		1.7	
F.	15	6 5 13 10		6 23 13 9		6 32 11 2		6 49 11 1		6 53 11 10		7 11 11 10		2.7	
S.	16	6 40 13 7		6 57 13 5		7 6 11 0		7 22 10 10		7 27 11 9		7 43 11 9		3.7	
S.	17	7 15 13 3		7 34 13 0		7 39 10 9		7 57 10 7		7 59 11 8		8 16 11 6		4.7	
M.	18	7 53 12 9		8 12 12 6		8 14 10 5		8 30 10 3		8 32 11 5		8 49 11 3		5.7	
Tu.	19	8 32 12 2		8 52 11 9		8 47 10 1		9 5 9 10		9 5 11 1		9 21 10 10		6.7	
W.	20	9 14 11 5		9 38 11 2		9 24 9 8		9 44 9 5		9 39 10 8		10 1 10 5		7.7	
Th.	21	10 6 10 11		10 38 10 9		10 9 9 3		10 37 9 2		10 29 10 2		10 59 10 0)	
F.	22	11 12 10 9		11 48 10 10		11 10 9 1		11 45 9 1		11 31 9 10		— —		9.7	
S.	23	— —		0 25 11 0		— —		0 23 9 2		0 3 9 10		0 36 9 11		10.7	
S.	24	1 0 11 4		1 33 11 9		1 0 9 4		1 38 9 7		1 10 10 1		1 46 10 4		11.7	
M.	25	2 3 12 2		2 30 12 8		2 14 9 11		2 45 10 3		2 23 10 8		2 57 11 1		12.7	
Tu.	26	2 57 13 3		3 24 13 9		3 15 10 7		3 43 11 0		3 30 11 5		4 1 11 9		13.7	
W.	27	3 48 14 3		4 11 14 9		4 9 11 5		4 34 11 9		4 29 12 2		4 56 12 5		14.7	
Th.	28	4 36 15 3		4 59 15 7		5 0 12 1		5 25 12 4		5 22 12 8		5 47 12 11		○	
F.	29	5 23 15 11		5 47 16 0		5 50 12 6		6 14 12 7		6 11 13 2		6 34 13 3		16.7	
S.	30	6 11 16 0		6 34 15 11		6 37 12 7		7 0 12 6		6 58 13 3		7 21 13 3		17.7	
S.	31	6 57 15 8		7 22 15 4		7 23 12 4		7 47 12 1		7 44 13 2		8 7 13 0		18.7	
Half Mean Spring } Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.					

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 58		9	7 31		17	10 29		25	12 41	
2	4 26		10	7 55		18	10 48		26	12 53	
3	4 54		11	8 19		19	11 7		27	13 5	
4	5 21		12	8 42		20	11 24		28	13 17	
5	5 48		13	9 5		21	11 41		29	13 27	
6	6 14		14	9 27		22	11 57		30	13 37	
7	6 40		15	9 48		23	12 12		31	13 45	
8	7 6		16	10 9		24	12 27				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 8 m.

TIDE TABLES FOR THE

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.		Height.			Time.		Height.			Time.		Height.				Time.		Height.				Time.		Height.				
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
M.	1	3m56	6	52	19	4	7	15	18	8	8	48	15	11	9	9	15	1	2	28	13	1	2	53	12	10					
Tu.	2	4 47	7	39	17	11	8	2	17	1	9	30	15	2	9	52	14	4	3	16	12	7	3	38	12	3					
W.	3	5 38	8	26	16	3	8	53	15	5	10	15	14	3	10	38	13	6	4	0	11	10	4	23	11	6					
Th.	4	6 28	9	21	14	9	9	54	14	4	11	4	13	3	11	31	12	10	4	49	11	1	5	17	10	8					
F.	5	7 18	10	31	14	0	11	13	13	10	—	—	—	—	0	3	12	7	5	48	10	4	6	23	10	2					
S.	6	8 9	11	54	13	10	—	—	—	—	0	40	12	5	1	18	12	5	7	2	10	0	7	42	10	1					
S.	7	8 59	0	34	14	0	1	10	14	5	1	57	12	7	2	34	12	8	8	23	10	3	9	0	10	6					
M.	8	9 49	1	42	14	10	2	9	15	4	3	8	13	2	3	40	13	1	9	33	10	9	10	0	11	0					
Tu.	9	10 38	2	31	15	11	2	52	16	6	4	7	13	10	4	34	13	7	10	26	11	3	10	48	11	6					
W.	10	11 26	3	11	17	0	3	29	17	4	4	58	14	5	5	18	14	0	11	7	11	8	11	25	11	9					
Th.	11	0a12	3	47	17	8	4	4	17	11	5	38	14	10	5	57	14	4	11	43	11	11	12	0	12	1					
F.	12	0 57	4	21	18	1	4	38	18	3	6	15	15	1	6	32	14	6	—	—	—	—	0	17	12	1					
S.	13	1 40	4	54	18	3	5	9	18	3	6	49	15	2	7	5	14	6	0	34	12	2	0	52	12	2					
S.	14	2 22	5	25	18	3	5	39	18	2	7	18	15	0	7	33	14	8	1	9	12	2	1	25	12	2					
M.	15	3 4	5	53	18	0	6	9	17	10	7	47	14	8	8	2	14	1	1	40	12	2	1	55	12	1					
Tu.	16	3 46	6	25	17	7	6	42	17	2	8	18	14	3	8	33	13	8	2	10	12	0	2	26	11	1					
W.	17	4 30	6	59	16	9	7	17	16	4	8	48	13	9	9	2	13	4	2	43	11	9	3	0	11	7					
Th.	18	5 15	7	36	15	9	7	57	15	2	9	18	13	2	9	38	12	10	3	18	11	5	3	36	11	2					
F.	19	6 4	8	20	14	7	8	45	14	1	9	59	12	8	10	22	12	5	3	55	10	11	4	17	10	5					
S.	20	6 55	9	16	13	9	9	53	13	6	10	50	12	3	11	21	12	2	4	41	10	5	5	11	10	2					
S.	21	7 50	10	33	13	6	11	17	13	9	11	58	12	0	—	—	—	—	5	46	10	0	6	24	9	11					
M.	22	8 48	12	0	14	1	—	—	—	—	0	38	12	4	1	20	12	4	7	6	10	0	7	48	10	3					
Tu.	23	9 48	0	42	14	9	1	18	15	6	2	2	13	0	2	43	13	0	8	30	10	7	9	9	11	1					
W.	24	10 48	1	50	16	6	2	17	17	6	3	21	14	0	3	56	14	0	9	42	11	7	10	11	12	1					
Th.	25	11 47	2	42	18	6	3	6	19	5	4	26	15	1	4	54	15	0	10	38	12	6	11	2	12	11					
F.	26	morn.	3	29	20	3	3	53	20	9	5	21	16	0	5	47	15	9	11	25	13	3	11	49	13	6					
S.	27	0 45	4	16	21	1	4	38	21	4	6	12	16	7	6	36	16	3	—	—	—	—	0	12	13	6					
S.	28	1 41	5	0	21	5	5	22	21	4	6	59	16	11	7	21	16	4	0	36	13	9	0	59	13	6					
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.												
Phases of the Moon.												Moon's Declination at Noon.																			
D. H. M.												M.D. ° ' "																			
Last Quarter - 3 4 56 Afternoon.												1 18.30 9 18.53 17 7N.49 25 14.5.28																			
New - - - - 11 1 54 Afternoon.												2 6 13 10 17 7 18 11 31 26 10 22																			
First Quarter- 19 5 6 Afternoon.												3 10 28 11 14 38 19 14 46 27 5 35																			
Full - - - - 26 0 5 Afternoon.												4 14 4 12 11 33 20 17 24 28 0 24																			
In Apogee - - 13 3 0 Morning.												5 16 53 13 8 2 21 19 12																			
In Perigee - - 26 1 0 Afternoon.												6 18 48 14 4 11 22 19 55																			
												7 19 47 15 0 10 23 19 24																			
												8 19 47 16 3N.52 24 17 33																			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, — for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
M.	1	2 8 19 6	2 33 19 2	3 34 16 9	3 57 16 5	5 6 21 1	5 30 20 10	19.7						
Tu.	2	2 56 18 8	3 19 18 1	4 21 16 2	4 45 15 9	5 52 20 5	6 15 19 11	20.7						
W.	3	3 41 17 6	4 5 16 10	5 8 15 3	5 32 14 10	6 39 19 3	7 4 18 9	(
Th.	4	4 30 16 2	4 55 15 6	5 58 14 5	6 28 14 0	7 29 18 2	7 56 17 8	22.7						
F.	5	5 23 15 0	5 54 14 8	7 0 13 7	7 35 13 4	8 27 17 2	9 4 16 11	23.7						
S.	6	6 30 14 5	7 8 14 6	8 13 13 3	8 54 13 3	9 43 16 9	10 22 16 10	24.7						
S.	7	7 49 14 9	8 25 15 1	9 33 13 4	10 11 13 6	11 2 17 0	11 40 17 3	25.7						
M.	8	8 57 15 5	9 24 15 10	10 46 13 9	11 16 14 0	— —	0 15 17 6	26.7						
Tu.	9	9 49 16 2	10 12 16 7	11 43 14 3	— —	0 45 17 10	1 10 18 3	27.7						
W.	10	10 33 16 11	10 53 17 3	0 4 14 6	0 25 14 9	1 34 18 7	1 56 18 10	28.7						
Th.	11	11 12 17 6	11 32 17 8	0 44 15 0	1 2 15 2	2 16 19 1	2 35 19 3	●						
F.	12	11 50 17 10	— —	1 20 15 4	1 37 15 6	2 52 19 5	3 8 19 7	0.9						
S.	13	0 8 17 11	0 26 18 0	1 53 15 7	2 9 15 7	3 24 19 8	3 40 19 9	1.9						
S.	14	0 43 18 1	1 0 18 1	2 25 15 8	2 41 15 7	3 55 19 9	4 10 19 9	2.9						
M.	15	1 17 18 0	1 33 17 11	2 56 15 7	3 9 15 6	4 25 19 9	4 41 19 8	3.9						
Tu.	16	1 49 17 10	2 6 17 8	3 23 15 5	3 39 15 3	4 55 19 7	5 11 19 6	4.9						
W.	17	2 23 17 5	2 41 17 1	3 55 15 1	4 12 14 11	5 27 19 4	5 43 19 1	5.9						
Th.	18	3 0 16 9	3 18 16 4	4 29 14 8	4 48 14 5	6 0 18 9	6 19 18 4	6.9						
F.	19	3 37 15 11	3 58 15 6	5 8 14 1	5 29 13 9	6 37 17 11	6 57 17 6)						
S.	20	4 21 15 0	4 48 14 7	5 53 13 6	6 20 13 3	7 21 17 2	7 48 16 10	8.9						
S.	21	5 21 14 4	5 55 14 3	6 54 13 0	7 33 12 11	8 22 16 6	9 0 16 5	9.9						
M.	22	6 32 14 5	7 14 14 9	8 15 13 0	8 57 13 2	9 41 16 6	10 24 16 9	10.9						
Tu.	23	7 56 15 4	8 34 16 1	9 39 13 6	10 18 13 11	11 8 17 2	11 48 17 8	11.9						
W.	24	9 5 16 10	9 34 17 7	10 53 14 5	11 24 14 11	— —	0 22 18 3	12.9						
Th.	25	10 2 18 3	10 28 18 11	11 50 15 5	— —	0 51 18 11	1 18 19 7	13.9						
F.	26	10 54 19 6	11 20 19 11	0 15 15 11	0 39 16 5	1 44 20 2	2 7 20 7	○						
S.	27	11 45 20 3	— —	1 2 16 9	1 26 17 1	2 30 21 0	2 54 21 3	15.9						
S.	28	0 10 20 6	0 34 20 7	1 49 17 4	2 11 17 5	3 18 21 6	3 40 21 8	16.9						
Half Mean Spring } Range.		9ft. 4in.				8ft. 0in.				10ft. 1½ in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	13 53	Sub.	9	14 29	Sub.	17	14 14	Sub.	25	13 14	Sub.
2	14 1		10	14 29		18	14 9		26	13 4	
3	14 7		11	14 30		19	14 3		27	12 53	
4	14 13		12	14 29		20	13 57		28	12 42	
5	14 17		13	14 27		21	13 50				
6	14 21		14	14 25		22	13 42				
7	14 25		15	14 22		23	13 33				
8	14 27		16	14 19		24	13 24				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	3m 56	2 51	11 10	3 15	11 8	9 33	21 6	9 58	21 0	6 24	14 8	6 50	14 3
Tu.	2	4 47	3 39	11 6	4 2	11 3	10 21	20 5	10 45	19 9	7 15	13 11	7 40	13 5
W.	3	5 38	4 24	11 0	4 46	10 9	11 9	19 1	11 38	18 5	8 5	13 0	8 30	12 6
Th.	4	6 28	5 11	10 6	5 39	10 3	—	—	0 12	17 10	9 0	12 1	9 31	11 8
F.	5	7 18	6 8	10 0	6 40	9 11	0 45	17 2	1 18	16 9	10 5	11 4	10 42	11 2
S.	6	8 9	7 20	9 10	8 2	9 9	1 52	16 6	2 28	16 5	11 20	11 0	11 57	11 1
S.	7	8 59	8 41	9 10	9 19	10 0	3 4	16 7	3 40	17 0	—	—	0 32	11 4
M.	8	9 49	9 53	10 2	10 25	10 4	4 15	17 5	4 45	17 9	1 5	11 7	1 35	11 11
Tu.	9	10 38	10 53	10 6	11 15	10 8	5 12	18 2	5 33	18 6	2 2	12 2	2 27	12 5
W.	10	11 26	11 37	10 10	11 57	11 0	5 53	18 10	6 13	19 2	2 49	12 9	3 9	13 0
Th.	11	0 12	—	—	0 15	11 1	6 32	19 5	6 50	19 8	3 27	13 2	3 43	13 5
F.	12	0 57	0 33	11 2	0 50	11 2	7 8	19 10	7 25	20 0	4 0	13 7	4 16	13 9
S.	13	1 40	1 6	11 3	1 23	11 3	7 42	20 1	7 59	20 2	4 32	13 10	4 48	13 11
S.	14	2 22	1 40	11 3	1 56	11 2	8 14	20 2	8 29	20 2	5 4	13 11	5 19	13 10
M.	15	3 4	2 11	11 2	2 26	11 1	8 44	20 1	8 58	19 11	5 34	13 9	5 49	13 7
Tu.	16	3 46	2 41	11 0	2 57	10 11	9 14	19 8	9 31	19 5	6 5	13 4	6 22	13 2
W.	17	4 30	3 13	10 10	3 30	10 8	9 48	19 1	10 5	18 9	6 40	12 11	6 59	12 8
Th.	18	5 15	3 47	10 6	4 5	10 5	10 23	18 4	10 43	17 11	7 19	12 5	7 39	12 1
F.	19	6 4	4 23	10	4 43	10 0	11 6	17 6	11 33	17 0	8 1	11 9	8 25	11 6
S.	20	6 55	5 6	9 10	5 31	9 9	—	—	0 3	16 8	8 52	11 3	9 26	11 0
S.	21	7 50	6 1	9 8	6 39	9 7	0 39	16 3	1 16	16 1	10 4	10 10	10 43	10 10
M.	22	8 48	7 22	9 8	8 5	9 9	1 53	16 1	2 30	16 4	11 23	11 0	—	—
Tu.	23	9 48	8 46	10 0	9 26	10 3	3 8	16 11	3 47	17 7	0 1	11 4	0 38	11 9
W.	24	10 48	10 1	10 7	10 33	10 11	4 22	18 5	4 53	19 2	1 12	12 4	1 43	12 11
Th.	25	11 47	11 1	11 3	11 27	11 7	5 18	20 0	5 43	20 8	2 12	13 6	2 39	14 0
F.	26	morn.	11 51	11 11	—	—	6 7	21 4	6 32	21 10	3 3	14 6	3 26	15 0
S.	27	0 45	0 15	12 2	0 39	12 3	6 56	22 3	7 20	22 8	3 49	15 4	4 11	15 8
S.	28	1 41	1 2	12 4	1 24	12 5	7 43	22 11	8 5	22 11	4 33	15 10	4 55	15 11

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	3	4	56	Afternoon.	1	18	30	9	18	53	17	7	N.49	25	14	E.25
New - - - -	11	1	54	Afternoon.	2	6	13	10	17	7	18					
First Quarter	19	5	6	Afternoon.	11	10	28	11	14	38	19					
Full - - - -	26	0	5	Afternoon.	4	14	4	12	11	33	20					
					5	16	53	13	8	2	21					
In Apogee - -	13	3	0	Morning.	6	18	48	14	4	11	22					
In Perigee - -	26	1	0	Afternoon.	7	19	47	15	0	10	23					
					8	19	47	16	3	N.52	24					

The times of High Water are given for Mean Time at Place; if Greenwich or Railw
 HARWICH subtract 8 m. HULL add 1 m. SUNDERLAND

FEBRUARY, 1869.																										
WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		D.			
		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.					
M.	1	6 28	13 6		6 53	13 3		5 23	16 7		5 48	16 3		11 40	13 1		—	—		—	—		19.7			
Tu.	2	7 17	12 10		7 42	12 5		6 13	15 10		6 38	15 3		0 5	12 7		0 30	12 1		0 30	12 1		20.7			
W.	3	8 8	11 10		8 36	11 4		7 3	14 9		7 30	14 3		0 55	11 7		1 22	11 1		1 22	11 1		21.7			
Th.	4	9 8	10 10		9 41	10 6		8 2	13 9		8 35	13 3		1 53	10 8		2 26	10 2		2 26	10 2		22.7			
F.	5	10 17	10 3		10 54	10 1		9 10	12 11		9 48	12 9		3 2	9 11		3 44	9 8		3 44	9 8		23.7			
S.	6	11 32	10 1		—	—		10 27	12 8		11 4	12 8		4 25	9 6		5 4	9 5		5 4	9 5		24.7			
S.	7	0 10	10 2		0 46	10 4		11 39	12 10		—	—		5 41	9 6		6 13	9 9		6 13	9 9		25.7			
M.	8	1 17	10 6		1 46	10 8		0 12	13 1		0 40	13 4		6 42	10 1		7 5	10 6		7 5	10 6		26.7			
Tu.	9	2 11	10 11		2 32	11 3		1 4	13 9		1 27	14 1		7 24	11 0		7 42	11 5		7 42	11 5		27.7			
W.	10	2 52	11 7		3 10	11 10		1 48	14 6		2 7	14 10		7 58	11 9		8 14	12 1		8 14	12 1		28.7			
Th.	11	3 27	12 1		3 44	12 4		2 25	15 1		2 42	15 4		8 30	12 4		8 46	12 6		8 46	12 6		29.7			
F.	12	4 0	12 6		4 17	12 7		2 58	15 7		3 14	15 8		9 2	12 7		9 18	12 8		9 18	12 8		30.7			
S.	13	4 33	12 8		4 50	12 8		3 29	15 8		3 45	15 8		9 34	12 8		9 50	12 7		9 50	12 7		31.7			
S.	14	5 6	12 7		5 22	12 6		4 1	15 7		4 17	15 6		10 6	12 6		10 22	12 5		10 22	12 5		32.7			
M.	15	5 37	12 5		5 53	12 4		4 32	15 5		4 48	15 4		10 38	12 3		10 54	12 1		10 54	12 1		33.7			
Tu.	16	6 9	12 2		6 26	12 0		5 4	15 2		5 20	15 0		11 11	11 10		11 30	11 7		11 30	11 7		34.7			
W.	17	6 43	11 10		7 1	11 8		5 38	14 9		5 57	14 6		11 49	11 4		—	—		—	—		35.7			
Th.	18	7 20	11 5		7 41	11 1		6 17	14 2		6 38															

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	53		9	14	29		17	14	14		25	13	14	
2	14	1		10	14	29		18	14	9		26	13	4	
3	14	7		11	14	30		19	14	3		27	12	53	
4	14	13		12	14	29		20	13	57		28	12	42	
5	14	17		13	14	27		21	13	50					
6	14	21		14	14	25		22	13	42					
7	14	25		15	14	22		23	13	33					
8	14	27		16	14	19		24	13	24					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS *add 6 m.* | LEITH *add 13 m.* | THURSO *add 14 m.*

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
M.	1	3m56	2 54 10 1	3 18 9 11	2 4 26 9	2 28 26 2	9 19 21 3	9 42 20 7						
Tu.	2	4 47	3 40 9 9	4 2 9 7	2 51 25 5	3 12 24 8	10 2 19 11	10 22 19 2						
W.	3	5 38	4 24 9 5	4 47 9 2	3 35 23 10	3 59 22 11	10 44 18 5	11 7 17 7						
Th.	4	6 28	5 14 8 11	5 42 8 8	4 28 22 0	4 59 21 3	11 31 16 9	11 59 16 3						
F.	5	7 18	6 14 8 6	6 49 8 3	5 34 20 8	6 14 20 4	— —	0 31 15 9						
S.	6	8 9	7 28 8 2	8 7 8 3	6 57 20 3	7 37 20 4	1 10 15 6	1 54 15 6						
S.	7	8 59	8 47 8 4	9 22 8 5	8 15 20 8	8 49 21 2	2 38 15 9	3 16 16 3						
M.	8	9 49	9 55 8 6	10 22 8 8	9 19 21 7	9 45 22 2	3 50 16 9	4 20 17 3						
Tu.	9	10 38	10 46 8 9	11 9 8 11	10 6 22 8	10 26 23 2	4 46 17 9	5 11 18 4						
W.	10	11 26	11 30 9 0	11 50 9 1	10 45 23 7	11 4 23 11	5 34 18 9	5 55 19 1						
Th.	11	0 12	— —	0 9 9 2	11 22 24 3	11 40 24 7	6 13 19 5	6 30 19 9						
F.	12	0 57	0 28 9 4	0 45 9 5	11 57 24 10	— —	6 47 20 0	7 4 20 1						
S.	13	1 40	1 2 9 5	1 19 9 6	0 13 25 0	0 30 25 1	7 20 20 2	7 36 20 2						
S.	14	2 22	1 35 9 6	1 51 9 6	0 46 25 2	1 1 25 1	7 52 20 2	8 6 20 1						
M.	15	3 4	2 5 9 6	2 20 9 6	1 16 25 0	1 31 24 9	8 21 19 11	8 37 19 8						
Tu.	16	3 46	2 35 9 5	2 51 9 4	1 46 24 5	2 2 24 1	8 53 19 5	9 10 19 1						
W.	17	4 30	3 8 9 3	3 24 9 2	2 18 23 8	2 35 23 4	9 26 18 9	9 43 18 3						
Th.	18	5 15	3 41 9 1	3 59 8 11	2 53 22 10	3 11 22 3	10 0 17 9	10 18 17 3						
F.	19	6 4	4 19 8 10	4 41 8 8	3 31 21 8	3 53 21 0	10 38 16 9	11 0 16 2						
S.	20	6 55	5 5 8 6	5 36 8 4	4 19 20 6	4 53 20 0	11 25 15 8	11 56 15 4						
S.	21	7 50	6 12 8 3	6 50 8 2	5 33 19 9	6 15 19 10	— —	0 32 15 4						
M.	22	8 48	7 31 8 2	8 13 8 4	7 1 20 2	7 42 20 8	1 14 15 5	2 1 15 10						
Tu.	23	9 48	8 54 8 6	9 31 8 9	8 22 21 6	8 56 22 5	2 45 16 6	3 25 17 5						
W.	24	10 48	10 3 9 0	10 32 9 4	9 26 23 6	9 52 24 6	4 0 18 5	4 31 19 5						
Th.	25	11 47	10 59 9 7	11 25 9 9	10 16 25 6	10 40 26 4	5 1 20 4	5 29 21 3						
F.	26	morn.	11 51 10 0	— —	11 4 27 1	11 28 27 9	5 55 21 11	6 20 22 6						
S.	27	0 45	0 16 10 2	0 40 10 4	11 51 28 3	— —	6 43 23 0	7 6 23 4						
S.	28	1 41	1 3 10 5	1 26 10 6	0 14 28 7	0 37 28 8	7 28 23 4	7 49 23 3						

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	3	4	56	Afternoon.
New - - - - -	11	1	54	Afternoon.
First Quarter -	19	5	6	Afternoon.
Full - - - - -	26	0	5	Afternoon.
In Apogee - -	13	3	0	Morning.
In Perigee - -	26	1	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	30	9	18	53	17	7	N.49	25	14	E.18
2	6	13	10	17	7	18	11	31	26	10	22
3	10	28	11	14	38	19	14	46	27	5	35
4	14	4	12	11	33	20	17	24	28	0	19
5	16	53	13	8	2	21	19	12			
6	18	48	14	4	11	22	19	55			
7	19	47	15	0	10	23	19	24			
8	19	47	16	3	N.52	24	17	33			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—57
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.
M.	1	9	56	38	2	10	16	37	1	0	55	16	5	1	22	16	1	1	57	11	0	2	22	10	10	19.7
Tu.	2	10	33	35	10	10	51	34	7	1	47	15	8	2	12	15	2	2	47	10	7	3	11	10	4	20.7
W.	3	11	11	33	3	11	35	31	11	2	37	14	8	3	4	14	2	3	36	10	1	4	2	9	10	C.
Th.	4	—	—	—	—	0	2	30	8	3	34	13	8	4	7	13	3	4	33	9	6	5	5	9	3	22.7
F.	5	0	34	29	9	1	9	29	1	4	43	13	0	5	21	12	10	5	38	9	0	6	12	8	11	23.7
S.	6	1	48	28	8	2	28	28	8	6	0	12	9	6	37	12	10	6	48	8	11	7	24	9	0	24.7
S.	7	3	10	29	0	3	50	29	7	7	13	12	11	7	45	13	2	8	0	9	2	8	35	9	3	25.7
M.	8	4	27	30	2	4	59	31	1	8	15	13	5	8	41	13	8	9	7	9	5	9	35	9	7	26.7
Tu.	9	5	27	31	11	5	52	32	9	9	2	14	0	9	21	14	4	10	0	9	9	10	21	9	11	27.7
W.	10	6	15	33	6	6	36	34	1	9	40	14	7	9	58	14	10	10	39	10	1	10	56	10	3	28.7
Th.	11	6	55	34	7	7	13	35	1	10	15	15	0	10	31	15	2	11	12	10	5	11	28	10	6	●
F.	12	7	31	35	6	7	48	35	10	10	46	15	4	11	1	15	5	11	45	10	7	—	—	—	—	0.9
S.	13	8	4	36	0	8	20	36	0	11	16	15	5	11	31	15	5	0	1	10	7	0	18	10	7	1.9
S.	14	8	35	36	0	8	48	36	0	11	47	15	5	—	—	—	—	0	34	10	7	0	50	10	7	2.9
M.	15	9	2	35	9	9	17	35	6	0	3	15	4	0	19	15	2	1	6	10	6	1	22	10	5	3.9
Tu.	16	9	31	35	2	9	46	34	7	0	36	15	0	0	54	14	10	1	38	10	3	1	55	10	2	4.9
W.	17	10	1	34	0	10	15	33	3	1	12	14	7	1	31	14	4	2	13	10	0	2	31	9	10	5.9
Th.	18	10	30	32	5	10	46	31	6	1	50	14	0	2	11	13	8	2	50	9	9	3	10	9	7	6.9
F.	19	11	5	30	7	11	27	29	9	2	33	13	5	2	58	13	1	3	32	9	4	3	56	9	2	7.9
S.	20	11	56	28	11	—	—	—	—	3	26	12	9	4	1	12	6	4	24	9	0	4	59	8	10	8.9
S.	21	0	32	28	5	1	10	28	4	4	42	12	5	5	23	12	6	5	36	8	9	6	13	8	9	9.9
M.	22	1	52	28	7	2	35	29	2	6	3	12	8	6	42	13	0	6	50	8	11	7	29	9	2	10.9
Tu.	23	3	18	30	1	4	0	31	5	7	19	13	5	7	52	13	11	8	7	9	5	8	43	9	8	11.9
W.	24	4	38	32	11	5	11	34	7	8	22	14	6	8	48	15	2	9	15	10	0	9	45	10	4	12.9
Th.	25	5	42	36	2	6	10	37	7	9	11	15	9	9	34	16	3	10	11	10	9	10	33	11	1	13.9
F.	26	6	37	38	9	7	2	39	7	9	57	16	9	10	20	17	1	10	55	11	4	11	18	11	7	○
S.	27	7	26	40	5	7	49	41	0	10	42	17	4	11	2	17	7	11	40	11	9	—	—	—	—	15.9
S.	28	8	11	41	1	8	32	41	0	11	22	17	7	11	44	17	6	0	2	11	10	0	25	11	9	16.9

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
1	13	53		9	14	29		17	14	14		25	13	14	
2	14	1		10	14	29		18	14	9		26	13	4	
3	14	7		11	14	30		19	14	3		27	12	53	
4	14	13		12	14	29		20	13	57		28	12	42	
5	14	17		13	14	27		21	13	50					
6	14	21		14	14	25		22	13	42					
7	14	25		15	14	22		23	13	33					
8	14	27		16	14	19		24	13	24					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. ! HOLYHEAD add 18 m. ! KINGSTOWN subtract 1 m. for Dublin Time.

1u.	9	10	35	9	30	0	0	9	57	0	10	0	47	0	0	7	0	0	10	4	9	0	4	23	9	0					
W.	10	11	26	10	16	9	0	10	34	9	0	7	28	6	11	7	47	7	0	4	42	10	1	5	0	10					
Th.	11	0	12	10	51	9	1	11	7	9	2	8	5	7	2	8	21	7	3	5	18	10	6	5	36	10					
F.	12	0	57	11	23	9	3	11	39	9	3	8	37	7	4	8	52	7	5	5	53	10	9	6	9	10					
S.	13	1	40	11	54	9	3	—	—	9	6	7	5	9	21	7	4	6	24	10	10	6	39	10	1						
S.	14	2	22	0	10	9	3	0	26	9	3	9	35	7	3	9	49	7	2	6	55	10	8	7	11	10					
M.	15	3	4	0	42	9	2	0	58	9	2	10	3	7	1	10	18	7	0	7	26	10	5	7	42	10					
Tu.	16	3	46	1	14	9	1	1	32	9	0	10	34	6	11	10	51	6	9	7	58	10	0	8	14	9					
W.	17	4	30	1	51	8	11	2	11	8	10	11	9	6	6	11	31	6	4	8	32	9	7	8	51	9					
Th.	18	5	15	2	31	8	9	2	53	8	7	11	57	6	1	—	—	9	12	9	1	9	37	8	10						
F.	19	6	4	3	16	11	5	3	40	8	4	0	25	5	10	0	56	5	8	10	4	8	7	10	34	8					
S.	20	6	55	4	7	8	3	4	40	8	1	1	31	5	7	2	11	5	0	11	10	8	3	11	49	8					
S.	21	7	50	5	17	8	0	5	54	8	0	2	54	5	6	3	32	5	8	—	—	0	28	8	1	8					
M.	22	8	48	6	33	8	0	7	14	8	1	4	8	5	11	4	43	6	2	1	7	8	4	1	47	8					
Tu.	23	9	48	7	53	11	3	8	27	8	6	5	14	6	5	5	42	6	8	2	26	8	11	2	59	9					
W.	24	10	48	8	56	8	9	9	22	9	1	6	7	7	0	6	32	7	3	3	27	9	10	3	50	10					
Th.	25	11	47	9	47	9	4	10	10	9	7	6	57	7	7	7	22	7	10	4	13	10	10	4	36	11					
F.	26	morn.	10	33	9	9	10	56	9	10	7	47	8	1	8	10	8	4	5	0	11	9	5	24	12						
S.	27	0	45	11	19	9	11	11	40	10	0	8	32	8	6	8	53	8	7	5	48	12	3	6	10	12					
S.	28	1	41	—	—	0	1	10	0	9	13	8	6	9	33	8	5	6	31	12	4	6	53	12	1	1					
Half Mean Spring } Range		4ft. 9in.										3ft. 10in.										5ft. 7in.									

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.				Moon's Declination at Noon.											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter	3	4	56	Afternoon.	1	18.30	9	18.53	17	7 N. 49	25	14 X. 24			
New	11	1	54	Afternoon.	2	6 13	10	17 7	18	11 31	26	10 24			
First Quarter	19	5	6	Afternoon.	3	10 28	11	14 38	19	14 46	27	5 31			
Full	26	0	5	Afternoon.	4	14 4	12	11 33	20	17 24	28	0 19			
					5	16 53	13	8 2	21	19 12					
					6	18 48	14	4 11	22	19 55					
In Apogee	13	3	0	Morning.	7	19 47	15	0 10	23	19 24					
In Perigee	26	1	0	Afternoon.	8	19 47	16	3 N. 52	24	17 33					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —
BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 2 m.

FEBRUARY, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
M.	1	7 47 14 11	8 12 14 5	8 11 11 10	8 33 11 7	8 30 12 10	8 51 12 6	19° 7						
Tu.	2	8 36 13 10	9 0 13 3	8 52 11 2	9 13 10 10	9 10 12 2	9 29 11 10	20° 7						
W.	3	9 25 12 7	9 54 12 0	9 36 10 5	10 0 10 0	9 50 11 5	10 17 11 0	(
Th.	4	10 25 11 6	10 59 11 3	10 26 9 8	10 58 9 5	10 48 10 7	11 20 10 3	22° 7						
F.	5	11 36 11 0	— —	11 34 9 3	— —	11 54 10 0	— —	23° 7						
S.	6	0 16 10 11	0 54 11 0	0 13 9 1	0 53 9 2	0 29 9 10	1 6 9 11	24° 7						
S.	7	1 31 11 2	2 3 11 5	1 34 9 3	2 12 9 5	1 43 10 0	2 21 10 2	25° 7						
M.	8	2 32 11 9	2 59 12 1	2 46 9 7	3 14 9 10	2 57 10 5	3 29 10 7	26° 7						
Tu.	9	3 22 12 5	3 43 12 9	3 40 10 1	4 3 10 4	3 56 10 10	4 21 11 1	27° 7						
W.	10	4 2 13 0	4 20 13 3	4 24 10 7	4 43 10 9	4 44 11 4	5 6 11 6	28° 7						
Th.	11	4 37 13 7	4 54 13 10	5 1 11 0	5 19 11 2	5 24 11 8	5 41 11 9	●						
F.	12	5 11 14 0	5 27 14 2	5 37 11 3	5 54 11 4	5 58 11 10	6 14 11 11	0° 9						
S.	13	5 44 14 3	6 1 14 3	6 11 11 4	6 27 11 4	6 31 12 0	6 48 12 1	1° 9						
S.	14	6 17 14 2	6 32 14 1	6 43 11 4	6 58 11 4	7 4 12 1	7 19 12 1	2° 9						
M.	15	6 47 13 11	7 3 13 9	7 13 11 3	7 28 11 1	7 34 12 0	7 49 11 11	3° 9						
Tu.	16	7 20 13 7	7 38 13 4	7 44 10 11	8 1 10 9	8 4 11 10	8 20 11 9	4° 9						
W.	17	7 56 13 0	8 15 12 8	8 17 10 7	8 33 10 4	8 35 11 7	8 51 11 4	5° 9						
Th.	18	8 35 12 3	8 57 11 9	8 50 10 1	9 9 9 10	9 7 11 1	9 24 10 10	6° 9						
F.	19	9 20 11 4	9 46 11 0	9 30 9 7	9 52 9 4	9 44 10 7	10 9 10 4)						
S.	20	10 19 10 9	10 58 10 8	10 20 9 2	10 57 9 0	10 42 10 0	11 17 9 10	8° 9						
S.	21	11 38 10 8	— —	11 35 9 0	— —	11 54 9 9	— —	9° 9						
M.	22	0 19 10 11	0 59 11 3	0 17 9 1	0 59 9 3	0 31 9 10	1 10 10 0	10° 9						
Tu.	23	1 37 11 8	2 10 12 3	1 42 9 7	2 21 10 0	1 50 10 4	2 31 10 9	11° 9						
W.	24	2 39 12 11	3 7 13 8	2 55 10 5	3 25 10 11	3 8 11 3	3 40 11 8	12° 9						
Th.	25	3 33 14 3	3 57 14 11	3 53 11 5	4 19 11 10	4 11 12 2	4 39 12 7	13° 9						
F.	26	4 20 15 5	4 43 15 11	4 44 12 3	5 8 12 6	5 6 12 11	5 31 13 2	○						
S.	27	5 6 16 4	5 29 16 7	5 32 12 9	5 56 12 11	5 54 13 4	6 16 13 7	15° 9						
S.	28	5 52 16 7	6 14 16 6	6 19 13 0	6 41 12 11	6 39 13 7	7 2 13 7	16° 9						

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	53	Sub.	9	14	29	Sub.	17	14	14	Sub.	25	13	14	Sub.
2	14	1		10	14	29		18	14	9		26	13	4	
3	14	7		11	14	30		19	14	3		27	12	53	
4	14	13		12	14	29		20	13	57		28	12	42	
5	14	17		13	14	27		21	13	50					
6	14	21		14	14	25		22	13	42					
7	14	25		15	14	22		23	13	33					
8	14	27		16	14	19		24	13	24					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

MARCH, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
M.	1	5 19 14 5	5 42 14 3	4 14 17 8	4 36 17 5	10 26 14 5	10 49 14 0	17.9						
Tu.	2	6 4 13 11	6 27 13 7	4 59 17 1	5 22 16 7	11 13 13 6	11 37 13 0	18.9						
W.	3	6 50 13 2	7 12 12 8	5 45 16 2	6 8 15 7	12 0 12 5	— —	19.9						
Th.	4	7 36 12 1	8 3 11 6	6 33 14 11	6 58 14 4	0 24 11 9	0 50 11 2	20.9						
F.	5	8 31 10 10	9 1 10 4	7 25 13 8	7 56 13 1	1 17 10 7	1 46 10 1	21.9						
S.	6	9 37 9 11	10 19 9 8	8 31 12 7	9 12 12 3	2 22 9 7	3 4 9 2	22.9						
S.	7	10 59 9 6	11 39 9 7	9 54 12 1	10 34 12 1	3 50 9 0	4 32 8 11	23.9						
M.	8	— —	0 19 9 9	11 12 12 3	11 47 12 6	5 13 8 11	5 49 9 1	24.9						
Tu.	9	0 54 9 11	1 25 10 3	— —	0 20 12 10	6 21 9 6	6 47 10 0	25.9						
W.	10	1 52 10 7	2 13 10 11	0 46 13 3	1 7 13 8	7 6 10 6	7 23 11 0	26.9						
Th.	11	2 32 11 3	2 50 11 8	1 27 14 2	1 45 14 7	7 39 11 5	7 54 11 11	27.9						
F.	12	3 6 12 0	3 22 12 3	2 3 15 0	2 20 15 3	8 9 12 3	8 24 12 7	28.9						
S.	13	3 38 12 6	3 53 12 8	2 36 15 6	2 51 15 9	8 39 12 9	8 53 12 10	29.9						
S.	14	4 8 12 10	4 23 13 0	3 5 15 11	3 19 16 0	9 8 12 11	9 23 13 0	1.1						
M.	15	4 39 13 0	4 54 12 11	3 34 16 0	3 49 15 11	9 38 12 11	9 54 12 10	2.1						
Tu.	16	5 10 12 10	5 26 12 9	4 4 15 10	4 20 15 9	10 10 12 9	10 26 12 7	3.1						
W.	17	5 42 12 7	5 58 12 5	4 36 15 7	4 52 15 5	10 42 12 4	10 59 12 1	4.1						
Th.	18	6 15 12 3	6 32 12 0	5 8 15 2	5 26 14 11	11 18 11 9	11 38 11 5	5.1						
F.	19	6 50 11 9	7 10 11 5	5 46 14 7	6 7 14 3	11 59 11 0	— —	6.1						
S.	20	7 33 11 1	7 59 10 8	6 30 13 10	6 54 13 5	0 21 10 8	0 46 10 3	7.1						
S.	21	8 28 10 3	9 2 9 11	7 23 13 0	7 56 12 8	1 14 9 11	1 47 9 7	8.1						
M.	22	9 41 9 9	10 25 9 9	8 34 12 6	9 19 12 4	2 26 9 5	3 12 9 4	9.1						
Tu.	23	11 10 9 11	11 55 10 3	10 5 12 7	10 48 12 10	4 3 9 5	4 48 9 7	10.1						
W.	24	— —	0 33 10 8	11 26 13 3	12 0 13 10	5 28 9 11	6 1 10 7	11.1						
Th.	25	1 5 11 2	1 35 11 9	— —	0 29 14 6	6 31 11 3	6 53 12 1	12.1						
F.	26	2 0 12 4	2 23 12 11	0 54 15 3	1 18 16 0	7 14 12 10	7 33 13 7	13.1						
S.	27	2 44 13 6	3 5 13 11	1 41 16 8	2 3 17 2	7 52 14 2	8 12 14 7	14.1						
S.	28	3 27 14 6	3 48 14 8	2 25 17 7	2 46 17 10	8 34 14 10	8 55 14 11	15.1						
M.	29	4 10 14 9	4 32 14 8	3 7 17 11	3 28 17 10	9 16 14 10	9 38 14 8	16.1						
Tu.	30	4 54 14 6	5 17 14 2	3 49 17 8	4 11 17 4	10 1 14 4	10 23 14 0	17.1						
W.	31	5 39 13 10	6 1 13 5	4 33 17 0	4 55 16 7	10 45 13 6	11 8 12 11	18.1						
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	30	Sub.	9	10	39	Sub.	17	8	26	Sub.	25	6	1	Sub.
2	12	18		10	10	24		18	8	9		26	5	43	
3	12	5		11	10	8		19	7	51		27	5	24	
4	11	52		12	9	51		20	7	33		28	5	5	
5	11	38		13	9	35		21	7	15		29	4	47	
6	11	24		14	9	18		22	6	56		30	4	28	
7	11	9		15	9	1		23	6	38		31	4	10	
8	10	54		16	8	44		24	6	20					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 18 m. | THURSO add 14 m.

MARCH, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	2m35	1 48	10 6	2 10	10 5	0 59	28 7	1 21	28 2	8 10	22 11	8 32	23 5
Tu.	2	3 28	2 31	10 4	2 53	10 2	1 42	27 7	2 3	26 10	8 54	21 10	9 16	21 2
W.	3	4 21	3 14	9 11	3 34	9 8	2 25	26 0	2 45	25 1	9 36	20 4	9 56	19 5
Th.	4	5 13	3 56	9 5	4 19	9 2	3 7	24 1	3 30	23 1	10 17	18 7	10 39	17 8
F.	5	6 5	4 42	8 11	5 7	8 8	3 54	22 0	4 21	21 1	11 2	16 8	11 27	15 9
S.	6	6 56	5 37	8 5	6 14	8 2	4 55	20 2	5 36	19 7	11 59	15 2	—	—
♄.	7	7 46	6 54	8 0	7 35	7 11	6 20	19 3	7 4	19 4	0 36	14 10	1 18	14 8
M.	8	8 36	8 17	8 0	8 55	8 2	7 46	19 7	8 24	20 1	2 5	14 10	2 47	15 3
Tu.	9	9 24	9 31	8 4	10 1	8 6	8 57	20 8	9 25	21 5	3 25	15 10	3 57	16 7
W.	10	10 10	10 25	8 8	10 47	8 9	9 47	22 1	10 7	22 9	4 23	17 3	4 47	17 10
Th.	11	10 55	11 7	8 11	11 26	9 0	10 24	23 3	10 41	23 9	5 9	18 4	5 30	18 13
F.	12	11 38	11 45	9 2	—	—	10 58	24 2	11 15	24 7	5 49	19 4	6 7	19 4
S.	13	0 21	0 3	9 3	0 20	9 5	11 31	24 11	11 47	25 3	6 23	20 0	6 38	20 4
♄.	14	1 3	0 35	9 6	0 51	9 7	—	—	0 3	25 5	6 54	20 7	7 9	20 8
M.	15	1 45	1 7	9 7	1 23	9 8	0 19	25 7	0 34	25 8	7 24	20 8	7 39	20 7
Tu.	16	2 28	1 39	9 8	1 54	9 8	0 50	25 7	1 5	25 5	7 55	20 6	8 10	20 3
W.	17	3 13	2 9	9 7	2 24	9 7	1 19	25 2	1 34	24 11	8 26	20 1	8 42	19 3
Th.	18	4 0	2 40	9 6	2 57	9 4	1 50	24 6	2 7	24 0	8 59	19 4	9 16	18 13
F.	19	4 49	3 13	9 3	3 30	9 1	2 24	23 5	2 42	22 10	9 33	18 4	9 52	17 19
S.	20	5 41	3 51	8 11	4 13	8 10	3 3	22 3	3 25	21 8	10 12	17 3	10 35	16 8
♄.	21	6 36	4 39	8 8	5 6	8 6	3 50	20 11	4 21	20 4	10 59	16 0	11 27	15 6
M.	22	7 33	5 40	8 4	6 20	8 2	4 58	19 11	5 43	19 9	—	—	0 3	15 4
Tu.	23	8 31	7 5	8 2	7 51	8 4	6 34	20 0	7 21	20 7	0 46	15 5	1 37	15 9
W.	24	9 29	8 33	8 6	9 10	8 9	8 1	21 5	8 37	22 5	2 24	16 5	3 4	17 4
Th.	25	10 26	9 44	9 1	10 13	9 4	9 8	23 6	9 34	24 8	3 40	18 5	4 11	19 6
F.	26	11 22	10 38	9 7	11 3	9 10	9 57	25 8	10 19	26 7	4 40	20 6	5 7	21 4
S.	27	morn.	11 28	10 0	11 52	10 2	10 42	27 3	11 5	27 11	5 32	22 1	5 56	22 8
♄.	28	0 18	—	—	0 15	10 4	11 28	28 4	11 50	28 7	6 19	23 1	6 41	23 4
M.	29	1 12	0 38	10 5	1 1	10 5	—	—	0 12	28 8	7 3	23 4	7 24	23 2
Tu.	30	2 6	1 24	10 5	1 46	10 4	0 34	28 5	0 56	28 1	7 46	22 9	8 7	22 4
W.	31	3 1	2 6	10 3	2 27	10 1	1 17	27 6	1 38	27 9	8 29	21 9	8 50	21 0

Half Mean Spring }
Range. 4ft. 10in.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	5	5	43	Morning.
New - - - - -	13	8	46	Morning.
First Quarter -	21	5	54	Morning.
Full - - - - -	27	9	33	Afternoon.
In Apogee - -	12	5	0	Morning.
In Perigee - -	27	1	0	Morning.

Moon's Declination at Noon.

M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'
1	4	8.31	9	17	8.39	17	10	N.45	25	12	S.23
2	9	8	10	15	20	18	14	7	26	7	54
3	13	7	11	12	23	19	16	54	27	2	52
4	16	15	12	8	57	20	18	55	28	28	19
5	18	28	13	5	9	21	19	57	29	7	17
6	19	41	14	1	8	22	19	52	30	11	43
7	19	56	15	2	N.57	23	18	33	31	15	23
8	19	13	16	6	58	24	16	1			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 2 m.

MARCH, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
M.	1	8 53 40 7		9 13 39 10		— —		0 7 17 3		0 48 11 8		1 10 11 7		17.9
Tu.	2	9 33 39 0		9 53 37 10		0 30 16 11		0 54 16 6		1 33 11 4		1 56 11 1		18.9
W.	3	10 10 36 7		10 28 35 1		1 18 16 0		1 42 15 5		2 19 10 9		2 42 10 6		19.9
Th.	4	10 47 33 7		11 6 32 0		2 6 14 10		2 31 14 3		3 6 10 2		3 31 9 10		20.9
F.	5	11 28 30 6		11 57 29 2		2 58 13 8		3 27 13 1		3 57 9 6		4 26 9 2		21.9
S.	6	— —		0 34 28 1		4 3 12 7		4 45 12 3		5 1 8 10		5 38 8 8		22.9
S.	7	1 13 27 6		1 55 27 4		5 27 12 2		6 7 12 2		6 16 8 7		6 55 8 8		23.9
M.	8	2 39 27 6		3 20 28 1		6 46 12 4		7 21 12 7		7 33 8 9		8 8 8 11		24.9
Tu.	9	3 59 28 11		4 34 29 11		7 53 12 10		8 20 13 3		8 42 9 1		9 13 9 4		25.9
W.	10	5 2 31 0		5 28 32 0		8 42 13 8		9 2 14 0		9 38 9 7		10 1 9 9		26.9
Th.	11	5 50 32 11		6 11 33 9		9 19 14 4		9 36 14 8		10 19 10 0		10 35 10 2		27.9
F.	12	6 31 34 6		6 49 35 1		9 53 15 0		10 9 15 2		10 50 10 4		11 6 10 6		28.9
S.	13	7 6 35 6		7 22 36 0		10 24 15 4		10 38 15 6		11 21 10 8		11 35 10 9		29.9
S.	14	7 38 36 6		7 53 36 8		10 51 15 8		11 5 15 9		11 50 10 9		— —		1.1
M.	15	8 8 36 9		8 23 36 9		11 19 15 9		11 35 15 8		0 6 10 9		0 22 10 9		2.1
Tu.	16	8 37 36 7		8 51 36 4		11 51 15 7		— —		0 38 10 9		0 54 10 8		3.1
W.	17	9 6 36 1		9 21 35 7		0 7 15 5		0 24 15 3		1 10 10 7		1 26 10 5		4.1
Th.	18	9 36 35 0		9 51 34 2		0 41 15 1		1 0 14 10		1 43 10 3		2 1 10 1		5.1
F.	19	10 6 33 4		10 22 32 5		1 20 14 5		1 40 14 1		2 20 9 11		2 40 9 9		6.1
S.	20	10 40 31 6		11 2 30 5		2 3 13 9		2 28 13 4		3 2 9 6		3 26 9 4		7.1
S.	21	11 28 29 5		12 0 28 9		2 55 13 0		3 28 12 8		3 53 9 2		4 26 8 11		8.1
M.	22	— —		0 39 28 3		4 6 12 6		4 51 12 5		5 4 8 9		5 44 8 7		9.1
Tu.	23	1 25 28 6		2 12 29 0		5 38 12 7		6 22 12 11		6 27 8 10		7 9 9 1		10.1
W.	24	2 56 30 0		3 38 31 5		7 0 13 4		7 33 13 11		7 47 9 4		8 23 9 8		11.1
Th.	25	4 17 33 0		4 51 34 9		8 4 14 7		8 30 15 3		8 56 10 0		9 26 10 5		12.1
F.	26	5 21 36 3		5 47 37 9		8 52 15 10		9 14 16 5		9 52 10 9		10 13 11 1		13.1
S.	27	6 13 38 11		6 38 39 10		9 36 16 10		9 58 17 3		10 34 11 4		10 55 11 7		14.1
S.	28	7 2 40 6		7 25 41 0		10 19 17 5		10 39 17 7		11 16 11 9		11 38 11 10		15.1
M.	29	7 47 41 1		8 8 40 10		10 59 17 7		11 20 17 5		12 0 11 9		— —		16.1
Tu.	30	8 29 40 4		8 49 39 8		11 42 17 2		— —		0 22 11 8		0 45 11 6		17.1
W.	31	9 9 38 9		9 28 37 9		0 4 16 10		0 27 16 5		1 7 11 4		1 30 11 1		18.1
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	30		9	10	39		17	8	26		25	6	1	
2	12	18		10	10	24		18	8	9		26	5	43	
3	12	5		11	10	8		19	7	51		27	5	24	
4	11	52		12	9	51		20	7	33		28	5	5	
5	11	38		13	9	35		21	7	15		29	4	47	
6	11	24		14	9	18		22	6	56		30	4	28	
7	11	9		15	9	1		23	6	38		31	4	10	
8	10	54		16	8	44		24	6	20					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MARCH, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	2m35	0 23	10 0	0 46	9 11	9 54	8 3	10 14	8 0	7 15	12 0	7 37	11 7												
Tu.	2	3 28	1 9	9 10	1 33	9 8	10 35	7 9	10 58	7 6	7 59	11 3	8 21	10 9												
W.	3	4 21	1 58	9 6	2 23	9 3	11 21	7 2	11 50	6 9	8 43	10 4	9 7	9 11												
Th.	4	5 13	2 48	9 0	3 14	8 9	—	—	0 21	6 4	9 34	9 5	10 4	9 0												
F.	5	6 5	3 41	8 6	4 9	8 4	0 55	6 0	1 32	5 9	10 36	8 7	11 12	8 4												
S.	6	6 56	4 42	8 2	5 19	8 0	2 14	5 7	2 56	5 6	11 52	8 2	—	—												
S.	7	7 46	5 57	7 10	6 37	7 10	3 36	5 7	4 12	5 8	0 31	8 0	1 11	8 0												
M.	8	8 36	7 18	7 10	7 55	7 11	4 46	5 9	5 16	5 11	1 51	8 1	2 27	8 3												
Tu.	9	9 24	8 28	8 1	8 55	8 3	5 43	6 1	6 7	6 3	3 0	8 7	3 26	8 11												
W.	10	10 10	9 16	8 6	9 36	8 8	6 27	6 6	6 47	6 8	3 46	9 3	4 4	9 7												
Th.	11	10 55	9 54	8 10	10 12	9 0	7 6	6 10	7 24	7 0	4 21	9 10	4 38	10 2												
F.	12	11 38	10 29	9 1	10 45	9 2	7 42	7 2	7 59	7 3	4 55	10 5	5 12	10 7												
S.	13	0 21	11 0	9 3	11 14	9 4	8 14	7 4	8 28	7 6	5 28	10 9	5 44	10 11												
S.	14	1 3	11 29	9 4	11 43	9 4	8 42	7 7	8 55	7 7	5 59	11 0	6 13	11 0												
M.	15	1 45	11 57	9 4	—	—	9 9	7 6	9 24	7 5	6 28	11 0	6 43	10 11												
Tu.	16	2 28	0 13	9 4	0 29	9 3	9 39	7 4	9 53	7 3	6 59	10 10	7 15	10 8												
W.	17	3 13	0 46	9 3	1 3	9 2	10 7	7 1	10 23	7 0	7 31	10 5	7 46	10 2												
Th.	18	4 0	1 20	9 1	1 39	9 0	10 40	6 10	10 58	6 7	8 3	9 11	8 21	9 7												
F.	19	4 49	1 59	8 11	2 21	8 9	11 20	6 4	11 48	6 1	8 40	9 4	9 4	9 1												
S.	20	5 41	2 45	8 7	3 10	8 5	—	—	0 18	5 10	9 31	8 10	10 2	8 6												
S.	21	6 36	3 37	8 3	4 8	8 2	0 54	5 8	1 33	5 6	10 37	8 4	11 16	8 3												
M.	22	7 33	4 45	8 1	5 25	8 0	2 17	5 6	3 2	5 7	11 58	8 3	—	—												
Tu.	23	8 31	6 8	8 0	6 53	8 1	3 46	5 10	4 25	6 1	0 42	8 4	1 27	8 6												
W.	24	9 29	7 33	8 2	8 8	8 5	4 57	6 5	5 24	6 8	2 6	8 10	2 40	9 4												
Th.	25	10 26	8 38	8 9	9 4	9 1	5 50	7 0	6 14	7 4	3 9	9 10	3 33	10 5												
F.	26	11 22	9 27	9 4	9 50	9 7	6 38	7 8	7 2	7 11	3 55	10 11	4 16	11 4												
S.	27	morn.	10 12	9 9	10 34	9 11	7 25	8 2	7 47	8 4	4 38	11 9	5 1	12 1												
S.	28	0 18	10 56	10 0	11 17	10 1	8 9	8 6	8 30	8 7	5 25	12 4	5 47	12 5												
M.	29	1 12	11 37	10 0	11 58	9 11	8 50	8 7	9 9	8 5	6 7	12 5	6 28	12 5												
Tu.	30	2 6	—	—	0 21	9 10	9 29	8 3	9 50	8 0	6 51	12 0	7 12	11 8												
W.	31	3 1	0 43	9 9	1 6	9 7	10 10	7 9	10 31	7 6	7 34	11 3	7 55	10 9												
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.															

Phases of the Moon.					Moon's Declination at Noon.														
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'			
Last Quarter-	5	5	43	Morning.	1	48.	31	9	17	8.	39	17	10	N.	45	25	12	N.	23
New- - - - -	13	8	46	Morning.	2	9	8	10	15	20	18	14	7	26	7	54			
First Quarter	21	5	54	Morning.	3	13	7	11	12	23	19	16	54	27	2	52			
Full - - - - -	27	9	33	Afternoon.	4	16	15	12	8	57	20	18	55	28	28	19			
					5	18	28	13	5	9	21	19	57	29	7	17			
In Apogee- -	12	5	0	Morning.	6	19	41	14	1	8	22	19	52	30	11	43			
In Perigee- -	27	1	0	Morning.	7	19	56	15	2	N.	57	23	18	33	31	15	20		
					8	19	13	16	6	58	24	16	1						

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 8 m.

MARCH, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
M.	1	6 36	16 3	6 58	15 10	7 2	12 9	7 24	12 6	7 24	13 6	7 45	13 4	17.9
Tu.	2	7 21	15 5	7 44	14 10	7 46	12 2	8 8	11 9	8 6	13 1	8 27	12 9	18.9
W.	3	8 7	14 3	8 31	13 6	8 27	11 5	8 46	10 11	8 45	12 4	9 4	11 11	19.9
Th.	4	8 55	12 9	9 20	12 0	9 8	10 6	9 31	10 0	9 24	11 6	9 46	11 1	20.9
F.	5	9 47	11 4	10 21	10 10	9 54	9 7	10 22	9 3	10 11	10 7	10 44	10 1	(
S.	6	11 0	10 6	11 42	10 4	10 59	8 11	11 39	8 9	11 20	9 9	11 58	9 6	22.9
S.	7	—	—	0 23	10 4	—	—	0 21	8 8	—	—	0 36	9 5	23.9
M.	8	1 3	10 5	1 39	10 9	1 3	8 9	1 43	9 0	1 14	9 6	1 52	9 8	24.9
Tu.	9	2 11	11 2	2 38	11 7	2 21	9 3	2 53	9 6	2 30	9 11	3 4	10 4	25.9
W.	10	3 1	12 0	3 23	12 5	3 18	9 10	3 41	10 2	3 32	10 7	3 57	10 11	26.9
Th.	11	3 41	12 9	3 58	13 2	4 1	10 5	4 20	10 8	4 19	11 2	4 40	11 5	27.9
F.	12	4 15	13 6	4 32	13 9	4 38	10 11	4 55	11 1	5 1	11 7	5 18	11 9	28.9
S.	13	4 47	14 1	5 2	14 3	5 12	11 3	5 28	11 5	5 34	11 11	5 49	12 0	●
S.	14	5 17	14 6	5 33	14 7	5 44	11 6	6 0	11 7	6 4	12 2	6 20	12 3	1.1
M.	15	5 48	14 7	6 4	14 6	6 15	11 7	6 31	11 7	6 35	12 3	6 52	12 3	2.1
Tu.	16	6 20	14 5	6 35	14 3	6 47	11 6	7 2	11 5	7 8	12 3	7 23	12 2	3.1
W.	17	6 51	14 1	7 8	13 9	7 17	11 3	7 33	11 1	7 38	12 1	7 53	12 0	4.1
Th.	18	7 26	13 6	7 45	13 2	7 50	10 11	8 6	10 8	8 9	11 10	8 25	11 8	5.1
F.	19	8 5	12 9	8 27	12 3	8 23	10 5	8 42	10 2	8 42	11 5	9 0	11 2	6.1
S.	20	8 51	11 9	9 17	11 3	9 3	9 10	9 27	9 6	9 18	10 10	9 41	10 6	7.1
S.	21	9 47	10 11	10 24	10 8	9 53	9 3	10 25	9 1	10 10	10 3	10 46	10 0)
M.	22	11 7	10 8	11 54	10 10	11 5	9 0	11 50	9 0	11 25	9 10	—	—	9.1
Tu.	23	—	—	0 39	11 2	—	—	0 37	9 3	0 8	9 9	0 50	10 0	10.1
W.	24	1 18	11 8	1 51	12 4	1 20	9 7	2 0	10 0	1 30	10 3	2 9	10 9	11.1
Th.	25	2 21	13 0	2 48	13 9	2 36	10 5	3 5	10 11	2 47	11 3	3 20	11 9	12.1
F.	26	3 14	14 4	3 36	15 0	3 32	11 5	3 57	11 11	3 50	12 2	4 17	12 8	13.1
S.	27	3 58	15 6	4 20	16 0	4 21	12 3	4 44	12 7	4 43	13 0	5 7	13 3	○
S.	28	4 42	16 4	5 4	16 7	5 8	12 10	5 31	12 11	5 30	13 5	5 52	13 7	15.1
M.	29	5 27	16 7	5 49	16 5	5 54	12 11	6 16	12 10	6 14	13 7	6 36	13 6	16.1
Tu.	30	6 11	16 2	6 33	15 9	6 38	12 8	6 59	12 5	6 58	13 5	7 20	13 3	17.1
W.	31	6 55	15 4	7 17	14 9	7 20	12 1	7 41	11 9	7 41	12 11	8 1	12 8	18.1
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	12 30	Sub.	9	10 39	Sub.	17	8 26	Sub.	25	6 1	Sub.
2	12 18		10	10 24		18	8 9		26	5 43	
3	12 5		11	10 8		19	7 51		27	5 24	
4	11 52		12	9 51		20	7 33		28	5 5	
5	11 38		13	9 35		21	7 15		29	4 47	
6	11 24		14	9 18		22	6 56		30	4 28	
7	11 9		15	9 1		23	6 38		31	4 10	
8	10 54		16	8 44		24	6 20				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 8 m.

APRIL, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.						
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
Th.	1	3m54	6	43	18	3	7	4	17	3	8	39	15	2	8	58	14	8	2	23	12	8	2	44	12	4				
F.	2	4 48	7	27	16	4	7	51	15	5	9	17	14	1	9	37	13	9	3	5	11	11	3	27	11	6				
S.	3	5 40	8	18	14	6	8	46	13	9	9	57	12	11	10	21	12	9	3	50	11	0	4	15	10	7				
S.	4	6 31	9	20	13	2	10	1	12	10	10	48	11	11	11	19	12	0	4	42	10	2	5	15	9	10				
M.	5	7 20	10	45	12	9	11	28	12	11	11	59	11	4	—	—			5	53	9	7	6	34	9	6				
Tu.	6	8 7	—	—			0	8	13	2	0	41	11	11	1	22	11	6	7	16	9	7	7	55	9	13				
W.	7	8 52	0	44	13	8	1	14	14	3	2	0	12	6	2	37	12	2	8	33	10	1	9	5	10	5				
Th.	8	9 36	1	40	14	11	2	0	15	6	3	8	13	3	3	38	12	11	9	32	10	9	9	54	11	1				
F.	9	10 19	2	20	16	2	2	37	16	9	4	1	13	11	4	23	13	5	10	15	11	4	10	33	11	7				
S.	10	11 1	2	54	17	4	3	10	17	10	4	44	14	6	5	3	14	3	10	50	11	10	11	6	12	0				
S.	11	11 43	3	25	18	2	3	41	18	5	5	21	15	0	5	37	14	9	11	21	12	2	11	37	12	4				
M.	12	0a26	3	56	18	8	4	12	18	9	5	53	15	3	6	9	15	11	11	52	12	5	—	—						
Tu.	13	1 11	4	27	18	9	4	43	18	9	6	25	15	4	6	41	15	2	0	8	12	6	0	25	12	6				
W.	14	1 57	4	58	18	9	5	15	18	7	6	57	15	2	7	11	15	0	0	42	12	5	0	59	12	3				
Th.	15	2 46	5	32	18	4	5	48	18	0	7	26	14	10	7	42	14	9	1	15	12	4	1	32	12	3				
F.	16	3 37	6	6	17	8	6	25	17	3	7	59	14	5	8	16	14	3	1	49	12	2	2	7	12	2				
S.	17	4 31	6	45	16	8	7	8	16	1	8	33	13	10	8	52	13	10	2	26	11	9	2	46	11	7				
S.	18	5 26	7	33	15	5	8	0	14	11	9	13	13	3	9	37	13	4	3	8	11	4	3	32	11	3				
M.	19	6 22	8	31	14	4	9	6	14	0	10	3	12	7	10	35	12	10	3	58	10	9	4	28	10	6				
Tu.	20	7 18	9	47	14	0	10	32	14	2	11	10	12	1	11	52	12	9	5	1	10	3	5	40	10	3				
W.	21	8 14	11	17	14	7	11	58	15	2	—	—			0	39	12	3	6	22	10	2	7	5	10	5				
Th.	22	9 8	—	—			0	34	15	11	1	25	12	4	2	7	13	1	7	45	10	9	8	24	11	3				
F.	23	10 3	1	6	16	9	1	34	17	7	2	44	14	2	3	19	14	1	8	57	11	8	9	26	12	1				
S.	24	10 56	1	58	18	5	2	22	19	3	3	47	15	2	4	15	15	1	9	53	12	6	10	18	12	10				
S.	25	11 50	2	45	20	0	3	7	20	5	4	41	16	0	5	6	15	11	10	41	13	2	11	3	13	4				
M.	26	morn.	3	30	20	8	3	52	20	9	5	29	16	6	5	51	16	3	11	26	13	5	11	48	13	6				
Tu.	27	0 44	4	14	20	8	4	35	20	5	6	14	16	7	6	36	16	4	—	—			0	11	13	5				
W.	28	1 39	4	56	20	2	5	17	19	9	6	56	16	3	7	15	16	0	0	34	13	4	0	56	13	2				
Th.	29	2 34	5	36	19	2	5	57	18	7	7	34	15	8	7	52	15	5	1	17	12	11	1	38	12	8				
F.	30	3 29	6	18	17	11	6	39	17	1	8	12	14	10	8	29	14	8	1	58	12	5	2	19	12	1				

Half Mean Spring }
Range.

9ft. 6in.

7ft. 9in.

6ft. 4in.

Phases of the Moon.				Moon's Declination at Noon.															
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
Last Quarter -	3	8	48	Afternoon.	1	18	S. 0	9	6	S. 13	17	20	N. 2	25	5	S. 0			
New - - - - -	12	1	47	Morning.	2	19	36	10	2	12	18	20	14	26	9	S. 0			
First Quarter -	19	3	6	Afternoon.	3	20	9	11	1	N. 56	19	19	16	27	14	S. 0			
Full - - - - -	26	6	21	Morning.	4	19	41	12	6	3	20	17	9	28	17	12			
					5	18	19	13	9	58	21	13	56	29	19	19			
In Apogee - -	8	1	0	Afternoon.	6	16	9	14	13	31	22	9	49	30	20	18			
In Perigee - -	24	7	0	Morning.	7	13	20	15	16	30	23	5	3						
					8	9	59	16	18	44	24	0	S. 3						

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required.—for
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

APRIL, 1869.

WEEK DAY.		MONTH DAY.		DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.	
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		D.	
				H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.		
Th.	1	2	3	19	0			2	25	18	3	3	31	16	5	3	52	16	0	5	3	20	9	5	23	20	4	19° 1	
F.	2	2	47	17	7			3	8	16	10	4	13	15	6	4	35	14	11	5	44	19	9	6	6	19	0	20° 1	
S.	3	3	31	16	1			3	56	15	4	4	58	14	5	5	23	13	11	6	30	18	4	6	53	17	8	21° 1	
M.	4	4	22	14	8			4	51	14	1	5	52	13	5	6	23	13	0	7	20	17	1	7	50	16	7	22° 1	
Tu.	5	5	26	13	9			6	3	13	6	7	0	12	8	7	42	12	7	8	26	16	2	9	8	16	0	23° 1	
W.	6	6	42	13	9			7	21	14	1	8	26	12	7	9	7	12	9	9	51	16	1	10	34	16	4	24° 1	
Th.	7	7	59	14	6			8	30	15	0	9	46	13	0	10	21	13	4	11	13	16	8	11	49	17	0	25° 1	
F.	8	8	55	15	6			9	17	16	0	10	49	13	8	11	14	14	1	—	—	—	—	0	19	17	5	26° 1	
S.	9	9	38	16	5			9	57	16	10	11	34	14	4	11	53	14	8	0	42	17	11	1	3	18	4	27° 1	
M.	10	10	15	17	3			10	33	17	7	—	—	—	—	0	10	15	0	1	23	18	9	1	41	19	1	28° 1	
Tu.	11	10	50	17	10			11	7	18	1	0	27	15	3	0	43	15	5	1	57	19	4	2	13	19	6	29° 1	
W.	12	11	24	18	3			11	41	18	5	0	58	15	8	1	14	15	10	2	27	19	9	2	43	19	11	30° 1	
Th.	13	11	58	18	5			—	—	—	—	1	29	15	11	1	44	16	0	2	59	20	0	3	14	20	0	31° 4	
F.	14	0	16	18	5			0	33	18	5	1	59	15	11	2	15	15	11	3	30	20	1	3	45	20	0	32° 4	
S.	15	0	51	18	4			1	10	18	2	2	30	15	10	2	46	15	9	4	1	20	0	4	17	19	11	33° 4	
M.	16	1	28	18	0			1	47	17	9	3	2	15	7	3	18	15	5	4	34	19	9	4	50	19	7	34° 4	
Tu.	17	2	6	17	5			2	27	17	0	3	36	15	2	3	55	14	11	5	9	19	5	5	27	19	1	35° 4	
W.	18	2	50	16	7			3	14	16	2	4	15	14	7	4	38	14	3	5	48	18	8	6	10	18	2	36° 4	
Th.	19	3	40	15	9			4	8	15	3	5	4	13	11	5	32	13	8	6	36	17	9	7	3	17	4	37° 4	
F.	20	4	39	14	10			5	14	14	8	6	6	13	5	6	45	13	2	7	35	17	0	8	13	16	9	38° 4	
S.	21	5	52	14	10			6	31	15	1	7	28	13	2	8	14	13	4	8	56	16	8	9	39	16	11	39° 4	
M.	22	7	11	15	8			7	49	16	4	8	56	13	8	9	36	14	2	10	21	17	4	11	3	17	11	40° 4	
Tu.	23	8	21	17	0			8	49	17	8	10	10	14	7	10	40	15	1	11	39	18	5	—	—	—	—	41° 4	
W.	24	9	16	18	3			9	42	18	10	11	8	15	6	11	32	15	11	0	9	19	0	0	37	19	7	42° 4	
Th.	25	10	7	19	4			10	31	19	8	11	55	16	4	—	—	—	—	1	2	20	2	1	26	20	7	43° 4	
F.	26	10	56	19	11			11	21	20	0	0	18	16	8	0	40	16	11	1	48	20	11	2	8	21	1	44° 4	
S.	27	11	44	20	0			—	—	—	—	1	3	17	1	1	25	17	1	2	31	21	3	2	54	21	4	45° 4	
M.	28	0	7	19	10			0	31	19	7	1	46	17	0	2	7	16	10	3	14	21	3	3	37	21	1	46° 4	
Tu.	29	0	54	19	3			1	16	18	10	2	28	16	8	2	48	16	5	3	57	20	11	4	18	20	8	47° 4	
W.	30	1	37	18	5			1	59	17	11	3	7	16	1	3	26	15	8	4	38	20	4	4	59	20	0	48° 4	
Half Mean Spring } Range.				9ft. 4in.				8ft. 0in.				10ft. 1½in.																	

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	52	Sub.	9	1	32	Sub.	17	0	31	Add.	25	2	10	Add.
2	3	34		10	1	16		18	0	45		26	2	20	
3	3	16		11	0	59		19	0	58		27	2	30	
4	2	58		12	0	44		20	1	11		28	2	39	
5	2	40		13	0	28		21	1	24		29	2	48	
6	2	23		14	0	13		22	1	36		30	2	57	
7	2	6		15	0	2		23	1	48					
8	1	49		16	0	17		24	1	59					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

APRIL, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.							
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.					
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.				
Th.	1	3m54	2 49	11 8	3 10	11 5	9 28	20 9	9 49	20 0	6 19	14 2	6 42	13 7				
F.	2	4 48	3 31	11 1	3 51	10 9	10 11	19 2	10 34	18 5	7 5	13 0	7 29	12 0				
S.	3	5 40	4 13	10 5	4 37	10 0	11 0	17 8	11 32	16 11	7 55	11 11	8 24	11 5				
S.	4	6 31	5 4	9 10	5 33	9 7	—	—	0 7	16 3	8 55	11 0	9 31	10 8				
M.	5	7 20	6 7	9 5	6 49	9 4	0 44	15 9	1 22	15 6	10 12	10 5	10 53	10 4				
Tu.	6	8 7	7 34	9 4	8 15	9 6	2 1	15 5	2 39	15 8	11 32	10 6	—	—				
W.	7	8 52	8 53	9 8	9 28	9 10	3 15	16 2	3 49	16 8	0 7	10 9	0 40	11 1				
Th.	8	9 36	9 57	10 1	10 23	10 4	4 18	17 3	4 43	17 9	1 8	11 6	1 33	11 11				
F.	9	10 19	10 45	10 6	11 4	10 9	5 3	18 3	5 21	18 9	1 55	12 3	2 16	12 7				
S.	10	11 1	11 22	10 11	11 40	11 2	5 38	19 2	5 55	19 6	2 34	12 11	2 52	13 2				
S.	11	11 43	11 56	11 3	—	—	6 12	19 9	6 28	20 1	3 8	13 5	3 22	13 8				
M.	12	0a26	0 11	11 4	0 26	11 5	6 44	20 3	7 0	20 6	3 37	13 11	3 52	14 1				
Tu.	13	1 11	0 41	11 6	0 56	11 6	7 15	20 7	7 31	20 7	4 6	14 2	4 21	14 3				
W.	14	1 57	1 12	11 5	1 29	11 5	7 48	20 7	8 3	20 7	4 37	14 3	4 53	14 2				
Th.	15	2 46	1 44	11 4	2 1	11 3	8 19	20 5	8 36	20 2	5 10	14 0	5 27	13 9				
F.	16	3 37	2 18	11 1	2 36	11 0	8 53	19 11	9 12	19 6	5 44	13 6	6 3	13 3				
S.	17	4 31	2 54	10 10	3 13	10 8	9 31	19 1	9 51	18 8	6 23	12 11	6 45	12 8				
S.	18	5 26	3 33	10 6	3 55	10 4	10 14	18 2	10 41	17 8	7 10	12 4	7 36	12 0				
M.	19	6 22	4 19	10 2	4 46	10 0	11 13	17 3	11 50	16 10	8 5	11 8	8 38	11 5				
Tu.	20	7 18	5 17	9 10	5 52	9 9	—	—	0 30	16 6	9 16	11 2	9 59	11 2				
W.	21	8 14	6 34	9 10	7 22	9 11	1 10	16 6	1 49	16 8	10 41	11 3	11 21	11 6				
Th.	22	9 8	8 4	10 1	8 43	10 4	2 28	17 2	3 5	17 10	11 57	12 0	—	—				
F.	23	10 3	9 17	10 8	9 49	11 0	3 39	18 8	4 9	19 5	0 29	12 6	0 59	13 1				
S.	24	10 56	10 18	11 4	10 43	11 7	4 37	20 1	5 0	20 9	1 27	13 7	1 54	14 2				
S.	25	11 50	11 7	11 11	11 31	12 1	5 23	21 4	5 47	21 9	2 19	14 6	2 43	14 12				
M.	26	morn.	11 53	12 2	—	—	6 10	22 0	6 33	22 3	3 4	15 1	3 26	15 3				
Tu.	27	0 44	0 16	12 3	0 37	12 3	6 56	22 4	7 18	22 3	3 47	15 5	4 8	15 7				
W.	28	1 39	0 59	12 2	1 21	12 0	7 40	22 1	8 1	21 10	4 29	15 3	4 50	15 1				
Th.	29	2 34	1 42	11 10	2 3	11 8	8 21	21 5	8 41	20 11	5 11	14 9	5 32	14 3				
F.	30	3 29	2 24	11 5	2 45	11 2	9 2	20 4	9 23	19 8	5 53	13 10	6 15	13 4				
Half Mean Spring } Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°				
Last Quarter - 3 8 48 Afternoon.							1	18	S. 0	9	6	S. 13	17	20 N. 2				
New - - - - - 12 1 47 Morning.							2	19	36	10	2	12	18	20 14				
First Quarter - 19 3 6 Afternoon.							3	20	9	11	1	N. 56	19	19 16				
Full - - - - - 26 6 21 Morning.							4	19	41	12	6	3	20	17 9				
							5	18	19	13	9	58	21	13 56				
In Apogee - - 8 1 0 Afternoon.							6	16	9	14	13	31	22	9 49				
In Perigee - - 24 7 0 Morning.							7	13	20	15	16	30	23	5 3				
							8	9	59	16	18	44	24	0 S. 3				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 3 m.

APRIL, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	D.
Th.	1	6 23	13 1	6 45	12 6	5 17	16 1	5 39	15 6	11 31	13 4	11 55	11 8	19° 1
F.	2	7 7	12 0	7 32	11 5	6 3	14 10	6 28	14 3	—	—	0 20	11 1	20° 1
S.	3	7 59	10 10	8 30	10 3	6 55	13 7	7 25	13 0	0 46	10 6	1 16	9 11	21° 1
●	4	9 3	9 10	9 43	9 6	7 57	12 6	8 35	12 2	1 49	9 6	2 27	9 1	22° 1
M.	5	10 24	9 4	11 5	9 4	9 18	11 11	10 0	11 11	3 11	8 10	3 58	8 9	23° 1
Tu.	6	11 45	9 6	—	—	10 38	12 0	11 14	12 3	4 38	8 10	5 16	9 0	24° 1
W.	7	0 21	9 9	0 54	10 11	11 47	12 7	—	—	5 49	9 3	6 16	9 8	25° 1
Th.	8	1 20	10 5	1 43	10 9	0 15	13 0	0 37	13 5	6 38	10 2	6 56	10 8	26° 1
F.	9	2 2	11 1	2 21	11 5	0 56	13 10	1 15	14 4	7 13	11 2	7 27	11 7	27° 1
S.	10	2 37	11 9	2 53	12 1	1 33	14 9	1 50	15 1	7 41	12 0	7 55	12 5	28° 1
●	11	3 8	12 4	3 22	12 7	2 5	15 5	2 20	15 8	8 9	13 8	8 24	12 11	29° 1
M.	12	3 37	12 10	3 52	12 11	2 35	15 11	2 50	16 0	8 38	13 0	8 52	13 1	30° 1
Tu.	13	4 7	13 0	4 22	13 1	3 14	16 1	3 19	16 1	9 7	13 1	9 23	13 0	31° 4
W.	14	4 39	13 0	4 56	13 10	3 35	16 0	3 51	15 11	9 40	12 11	9 57	12 5	32° 4
Th.	15	5 13	12 8	5 30	12 6	4 7	15 9	4 25	15 6	10 15	12 6	10 33	12 1	33° 4
F.	16	5 48	12 4	6 7	12 2	4 43	15 4	5 1	15 10	10 52	12 0	11 12	11 8	34° 4
S.	17	6 26	11 11	6 47	11 7	5 21	14 10	5 43	14 6	11 35	11 3	12 0	10 11	35° 4
●	18	7 11	11 3	7 39	10 10	6 8	14 1	6 35	13 8	—	—	0 27	10 6	36° 4
M.	19	8 10	10 6	8 46	10 2	7 5	13 3	7 41	13 0	0 56	10 2	1 31	9 11	37° 4
Tu.	20	9 26	10 0	10 11	10 1	8 20	12 9	9 4	12 8	2 11	9 8	2 56	8 8	38° 4
W.	21	10 53	10 3	11 34	10 6	9 48	12 10	10 27	13 2	3 45	9 9	4 27	9 11	39° 4
Th.	22	—	—	0 11	11 0	11 4	13 7	11 36	14 1	5 6	10 3	5 38	10 9	40° 4
F.	23	0 43	11 5	1 11	11 11	—	—	0 5	14 8	6 7	11 5	6 31	11 0	41° 4
S.	24	1 36	12 4	1 59	12 10	0 30	15 3	0 54	15 10	6 51	12 8	7 12	13 4	42° 4
●	25	2 22	13 4	2 44	13 9	1 18	16 5	1 41	16 11	7 32	13 10	7 52	14 2	43° 4
M.	26	3 5	14 0	3 26	14 2	2 3	17 2	2 25	17 5	8 13	14 5	8 34	14 6	44° 4
Tu.	27	3 48	14 3	4 10	14 3	2 46	17 6	3 6	17 5	8 54	14 4	9 15	14 2	45° 4
W.	28	4 32	14 1	4 54	13 9	3 26	17 2	3 47	16 11	9 37	13 11	9 59	13 6	46° 4
Th.	29	5 15	13 5	5 36	13 1	4 9	16 6	4 30	16 10	10 21	13 1	10 42	12 7	47° 4
F.	30	5 57	12 8	6 19	12 3	4 51	15 8	5 13	15 3	11 5	12 1	11 29	11 6	48° 4
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	52	Sub.	9	1	32	Sub.	17	0	31	Add.	25	2	10	Add.
2	3	34		10	1	16		18	0	45		26	2	20	
3	3	16		11	0	59		19	0	58		27	2	30	
4	2	58		12	0	44		20	1	11		28	2	39	
5	2	40		13	0	28		21	1	24		29	2	48	
6	2	23		14	0	13		22	1	36		30	2	57	
7	2	6		15	0	2	Add.	23	1	48					
8	1	49		16	0	17		24	1	59					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,— for
 NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

TIDE TABLES FOR THE

APRIL, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Th.	13	m 54	2 48	9 10	3 8	9 7	1 58	25 11	2 19	24 11	9 11	20 2	9 30	19
F.	2	4 48	3 29	9 4	3 50	9 2	2 39	23 11	3 1	22 11	9 50	18 5	10 12	17
S.	3	5 40	4 13	8 11	4 39	8 8	3 24	21 11	3 51	20 11	10 35	16 8	10 59	15
S.	4	6 31	5 7	8 5	5 40	8 2	4 22	20 1	4 59	19 5	11 27	15 1	—	—
M.	5	7 20	6 19	8 0	7 0	7 10	5 42	19 1	6 28	19 0	0 2	14 8	0 41	14
Tu.	6	8 7	7 41	7 11	8 20	8 0	7 11	19 3	7 49	19 8	1 26	14 7	2 9	14
W.	7	8 52	8 56	8 2	9 27	8 4	8 24	20 3	8 52	20 11	2 48	15 5	3 21	16
Th.	8	9 36	9 53	8 7	10 15	8 9	9 16	21 8	9 36	22 4	3 49	16 10	4 13	17
F.	9	10 19	10 35	8 10	10 54	9 0	9 55	23 0	10 12	23 6	4 35	18 1	4 56	18
S.	10	11 11	11 12	9 1	11 30	9 3	10 28	24 0	10 44	24 5	5 16	19 1	5 34	19
S.	11	11 43	11 47	9 4	—	—	11 0	24 10	11 16	25 2	5 51	19 11	6 7	20
M.	12	0 26	0 4	9 5	0 20	9 6	11 32	25 6	11 47	25 7	6 23	20 6	6 38	20
Tu.	13	1 11	0 35	9 7	0 52	9 8	—	—	0 3	25 8	6 54	20 9	7 10	20
W.	14	1 57	1 9	9 8	1 25	9 8	0 20	25 8	0 36	25 7	7 26	20 8	7 42	20
Th.	15	2 46	1 42	9 7	1 58	9 7	0 52	25 5	1 8	25 2	7 59	20 3	8 16	19
F.	16	3 37	2 15	9 6	2 33	9 5	1 25	24 9	1 42	24 3	8 34	19 7	8 53	19
S.	17	4 31	2 51	9 3	3 10	9 2	2 1	23 9	2 21	23 2	9 12	18 8	9 33	18
S.	18	5 26	3 31	9 0	3 56	8 11	2 43	22 7	3 7	22 0	9 55	17 6	10 19	17
M.	19	6 22	4 22	8 9	4 52	8 7	3 33	21 4	4 6	20 10	10 46	16 6	11 15	15
Tu.	20	7 18	5 26	8 5	6 6	8 4	4 44	20 4	5 28	20 4	11 50	15 10	—	—
W.	21	8 14	6 48	8 4	7 30	8 5	6 15	20 7	7 0	21 1	0 29	15 11	1 15	16
Th.	22	9 8	8 10	8 8	8 46	8 11	7 39	21 11	8 14	22 9	1 59	16 10	2 39	17
F.	23	10 3	9 19	9 2	9 47	9 4	8 43	23 9	9 10	24 8	3 14	18 7	3 45	19
S.	24	10 56	10 13	9 7	10 39	9 9	9 33	25 7	9 56	26 4	4 14	20 4	4 42	21
S.	25	11 50	11 4	9 11	11 28	10 0	10 19	26 11	10 42	27 4	5 9	21 9	5 33	22
M.	26	morn.	11 52	10 1	—	—	11 5	27 8	11 28	27 10	5 56	22 5	6 19	22
Tu.	27	0 44	0 15	10 2	0 38	10 2	11 50	27 9	—	—	6 41	22 7	7 22	22
W.	28	1 39	1 0	10 2	1 22	10 1	0 12	27 7	0 34	27 3	7 23	22 1	7 43	21
Th.	29	2 34	1 44	10 0	2 3	9 10	0 54	26 9	1 14	26 1	8 4	21 1	8 25	20
F.	30	3 29	2 23	9 8	2 44	9 6	1 34	25 3	1 54	24 6	8 46	19 9	9 7	19

Half Mean Spring Range. } 4ft. 10in.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	3	8	48	Afternoon.
New - - - - -	12	1	47	Morning.
First Quarter	19	3	6	Afternoon.
Full - - - - -	26	6	21	Morning.
In Apogee - -	8	1	0	Afternoon.
In Perigee - -	24	7	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	S.	0	9	6	S.	13	17	20	N.	2
2	19	36	10	2	12	18	20	14	26	9	5
3	20	9	11	1	N.	56	19	19	16	27	14
4	19	41	12	6	3	20	17	9	28	17	12
5	18	19	13	9	58	21	13	56	29	19	10
6	16	9	14	13	31	22	9	49	30	20	18
7	13	20	15	16	30	23	5	3			
8	9	59	16	18	44	24	0	S.	3		

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, —
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

APRIL, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
h.	1	7 39 14 1	8 2 13 5	8 1 11 4	8 2 10 10	8 20 12 3	8 39 11 10	19° 1						
.	2	8 25 12 9	8 51 11 11	8 41 10 5	9 3 10 0	8 58 11 5	9 18 11 0	20° 1						
.	3	9 18 11 3	9 48 10 9	9 27 9 6	9 52 9 2	9 42 10 7	10 11 10 1	(
.	4	10 25 10 4	11 6 10 2	10 24 8 10	11 4 8 8	10 47 9 9	11 24 9 6	22° 1						
L.	5	11 49 10 1	— —	11 46 8 7	— —	— —	0 2 9 3	23° 1						
u.	6	0 29 10 3	1 6 10 6	0 27 8 8	1 6 8 10	0 40 9 5	1 17 9 7	24° 1						
7.	7	1 39 10 11	2 6 11 4	1 44 9 1	2 17 9 4	1 53 9 10	2 27 10 1	25° 1						
h.	8	2 29 11 9	2 50 12 2	2 45 9 7	3 7 9 11	2 56 10 5	3 22 10 9	26° 1						
.	9	3 10 12 7	3 28 12 11	3 29 10 3	3 48 10 6	3 45 11 0	4 6 11 3	27° 1						
.	10	3 45 13 4	4 1 13 7	4 6 10 9	4 23 11 0	4 26 11 6	4 45 11 9	28° 1						
.	11	4 16 13 11	4 32 14 2	4 39 11 2	4 56 11 4	5 3 11 11	5 19 12 0	29° 1						
L.	12	4 46 14 5	5 1 14 6	5 12 11 6	5 28 11 7	5 34 12 1	5 48 12 2	●						
u.	13	5 17 14 7	5 34 14 7	5 44 11 7	6 1 11 7	6 4 12 3	6 21 12 3	1° 4						
7.	14	5 51 14 6	6 8 14 5	6 17 11 7	6 34 11 6	6 38 12 3	6 55 12 3	2° 4						
h.	15	6 25 14 2	6 43 14 0	6 51 11 5	7 8 11 3	7 12 12 2	7 29 12 0	3° 4						
.	16	7 1 13 8	7 20 13 4	7 25 11 0	7 44 10 10	7 46 11 11	8 3 11 9	4° 4						
.	17	7 42 13 0	8 6 12 6	8 3 10 7	8 23 10 3	8 21 11 6	8 41 11 3	5° 4						
.	18	8 32 12 0	9 0 11 7	8 46 10 0	9 11 9 9	9 2 11 0	9 25 10 9	6° 4						
L.	19	9 32 11 3	10 10 11 0	9 38 9 6	10 10 9 3	9 55 10 6	10 33 10 2)						
u.	20	10 52 11 0	11 37 11 2	10 51 9 3	11 34 9 3	11 12 10 1	11 51 10 0	8° 4						
7.	21	— —	0 18 11 6	— —	0 16 9 6	— —	0 29 10 3	9° 4						
h.	22	0 56 12 0	1 28 12 6	0 56 9 9	1 35 10 1	1 7 10 6	1 44 10 11	10° 4						
.	23	1 57 13 2	2 24 13 9	2 10 10 6	2 39 10 11	2 20 11 4	2 53 11 9	11° 4						
.	24	2 49 14 3	3 13 14 10	3 7 11 4	3 33 11 9	3 23 12 2	3 52 12 6	12° 4						
.	25	3 36 15 3	3 58 15 7	3 58 12 1	4 21 12 4	4 19 12 10	4 44 13 0	13° 4						
.	26	4 20 15 10	4 42 16 0	4 44 12 6	5 8 12 7	5 8 13 1	5 30 13 2	○						
u.	27	5 4 16 0	5 26 15 10	5 31 12 7	5 53 12 6	5 51 13 3	6 13 13 1	15° 4						
7.	28	5 48 15 7	6 10 15 3	6 15 12 4	6 36 12 1	6 35 13 0	6 57 12 10	16° 4						
h.	29	6 31 14 10	6 51 14 4	6 56 11 10	7 16 11 6	7 17 12 7	7 36 12 4	17° 4						
.	30	7 13 13 10	7 36 13 3	7 37 11 2	7 57 10 9	7 56 12 1	8 16 11 9	18° 4						
Half Mean Spring } Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

L.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Add.	M. D.	M. S.	Add.
1	3 52	Sub.	9	1 32	Sub.	17	0 31	Add.	25	2 10	Add.
2	3 34		10	1 16		18	0 45		26	2 20	
3	3 16		11	0 59		19	0 58		27	2 30	
4	2 58		12	0 44		20	1 11		28	2 39	
5	2 40		13	0 28		21	1 24		29	2 48	
6	2 23	Add.	14	0 13	Add.	22	1 36		30	2 57	
7	2 6		15	0 2		23	1 48				
8	1 49		16	0 17		24	1 59				

times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—fo
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.
C

APRIL, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.					
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.		
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.		
Th.	1	3m 54	1 29	9° 5	1 53	9 3	10 52	7 1	11 16	6 9	8 16	10 3	8 35	9 12		
F.	2	4 48	2 18	9 0	2 43	8 9	11 46	6 4	—	—	9 3	9 4	9 31	8 11		
S.	3	5 40	3 9	8 6	3 38	8 3	0 19	5 11	0 57	5 8	10 4	8 6	10 38	8 3		
S.	4	6 31	4 9	8 1	4 45	8 0	1 36	5 6	2 20	5 4	11 17	8 0	11 57	7 11		
M.	5	7 20	5 24	7 10	6 3	7 9	3 1	5 4	3 40	5 6	—	—	0 37	7 12		
Tu.	6	8 7	6 43	7 9	7 21	7 10	4 16	5 8	4 47	5 10	1 17	7 11	1 54	8 1		
W.	7	8 52	7 55	8 0	8 23	8 2	5 15	6 0	5 38	6 2	2 28	8 4	2 55	8 8		
Th.	8	9 36	8 46	8 4	9 6	8 7	5 57	6 5	6 16	6 7	3 17	9 0	3 36	9 4		
F.	9	10 19	9 25	8 9	9 42	8 10	6 35	6 9	6 53	6 11	3 53	9 8	4 9	10 3		
S.	10	11 1	9 59	9 0	10 15	9 2	7 10	7 1	7 27	7 3	4 25	10 3	4 41	10 6		
S.	11	11 43	10 29	9 3	10 43	9 4	7 43	7 4	7 59	7 5	4 57	10 9	5 13	10 11		
M.	12	on 26	10 58	9 4	11 13	9 4	8 13	7 6	8 27	7 7	5 28	11 0	5 43	11 1		
Tu.	13	1 11	11 28	9 4	11 44	9 4	8 41	7 7	8 56	7 7	5 58	11 1	6 14	11 3		
W.	14	1 57	12 0	9 4	—	—	9 11	7 6	9 26	7 4	6 30	10 11	6 47	10 9		
Th.	15	2 46	0 17	9 3	0 35	9 3	9 42	7 3	9 58	7 1	7 4	10 7	7 21	10 4		
F.	16	3 37	0 53	9 2	1 12	9 1	10 15	6 11	10 34	6 9	7 39	10 1	7 58	9 12		
S.	17	4 31	1 33	9 0	1 57	8 10	10 56	6 6	11 23	6 3	8 18	9 6	8 42	9 3		
S.	18	5 26	2 23	8 8	2 50	8 6	11 56	6 0	—	—	9 11	8 11	9 44	8 5		
M.	19	6 22	3 19	8 5	3 53	8 3	0 34	5 9	1 15	5 8	10 21	8 6	11 18	3		
Tu.	20	7 18	4 31	8 2	5 11	8 2	2 3	5 7	2 48	5 9	11 44	8 5	—	—		
W.	21	8 14	5 51	8 2	6 32	8 3	3 29	6 0	4 5	6 3	0 26	8 7	1 6	8 9		
Th.	22	9 8	7 11	8 4	7 44	8 6	4 36	6 7	5 2	6 10	1 44	9 1	2 17	9 6		
F.	23	10 3	8 13	8 9	8 39	9 1	5 27	7 1	5 50	7 4	2 45	9 11	3 10	10 4		
S.	24	10 56	9 3	9 4	9 27	9 6	6 14	7 7	6 38	7 10	3 32	10 10	3 53	11 1		
S.	25	11 50	9 50	9 8	10 12	9 9	7 2	8 0	7 25	8 2	4 15	11 7	4 38	11 12		
M.	26	morn.	10 33	9 10	10 54	9 10	7 47	8 3	8 8	8 4	5 1	12 0	5 24	12 1		
Tu.	27	0 44	11 15	9 10	11 36	9 9	8 28	8 4	8 48	8 2	5 45	12 1	6 5	11 11		
W.	28	1 39	11 57	9 8	—	—	9 8	8 0	9 28	7 9	6 27	11 8	6 48	11 4		
Th.	29	2 34	0 19	9 7	0 41	9 5	9 46	7 6	10 5	7 3	7 9	11 0	7 29	10 7		
F.	30	3 29	1 3	9 3	1 25	9 2	10 26	7 0	10 49	6 8	7 50	10 2	8 12	9 5		
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.					
Phases of the Moon.							Moon's Declination at Noon.									
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	
Last Quarter - 3 8 48 Afternoon.							1	8	8.	0	9	6	8.	13	17	20
New - - - - - 12 1 47 Morning.							2	19	36	10	2	12	18	20	14	26
First Quarter 19 3 6 Afternoon.							3	20	9	11	1	N.	56	19	19	16
Full - - - - - 26 6 21 Morning.							4	19	41	12	6	3	20	17	9	27
							5	18	19	13	9	58	21	13	56	28
In Apogee - - 8 1 0 Afternoon.							6	16	9	14	13	31	22	9	49	30
In Perigee - - 24 7 0 Morning.							7	13	20	15	16	30	23	5	3	20
							8	9	59	16	18	44	24	0	8.	3

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
BELFAST subtract 2m. | LONDONDERRY add 4m. | SLIGO BAY add 9m.

APRIL, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
Th.	1	7 39 14 1	8 2 13 5	8 1 11 4	8 21 10 10	8 20 12 3	8 39 11 10	19° 1						
F.	2	8 25 12 9	8 51 11 11	8 41 10 5	9 3 10 0	8 58 11 5	9 18 11 0	20° 1						
S.	3	9 18 11 3	9 48 10 9	9 27 9 6	9 52 9 2	9 42 10 7	10 11 10 1	(
S.	4	10 25 10 4	11 6 10 2	10 24 8 10	11 4 8 8	10 47 9 9	11 24 9 6	22° 1						
M.	5	11 49 10 1	— —	11 46 8 7	— —	— —	0 2 9 3	23° 1						
Tu.	6	0 29 10 3	1 6 10 6	0 27 8 8	1 6 8 10	0 40 9 5	1 17 9 7	24° 1						
W.	7	1 39 10 11	2 6 11 4	1 44 9 1	2 17 9 4	1 53 9 10	2 27 10 1	25° 1						
Th.	8	2 29 11 9	2 50 12 2	2 45 9 7	3 7 9 11	2 56 10 5	3 22 10 9	26° 1						
F.	9	3 10 12 7	3 28 12 11	3 29 10 3	3 48 10 6	3 45 11 0	4 6 11 3	27° 1						
S.	10	3 45 13 4	4 1 13 7	4 6 10 9	4 23 11 0	4 26 11 6	4 45 11 9	28° 1						
S.	11	4 16 13 11	4 32 14 2	4 39 11 2	4 56 11 4	5 3 11 11	5 19 12 0	29° 1						
M.	12	4 46 14 5	5 1 14 6	5 12 11 6	5 28 11 7	5 34 12 1	5 48 12 2	●						
Tu.	13	5 17 14 7	5 34 14 7	5 44 11 7	6 1 11 7	6 4 12 3	6 21 12 3	1° 4						
W.	14	5 51 14 6	6 8 14 5	6 17 11 7	6 34 11 6	6 38 12 3	6 55 12 3	2° 4						
Th.	15	6 25 14 2	6 43 14 0	6 51 11 5	7 8 11 3	7 12 12 2	7 29 12 0	3° 4						
F.	16	7 1 13 8	7 20 13 4	7 25 11 0	7 44 10 10	7 46 11 11	8 3 11 9	4° 4						
S.	17	7 42 13 0	8 6 12 6	8 3 10 7	8 23 10 3	8 21 11 6	8 41 11 3	5° 4						
S.	18	8 32 12 0	9 0 11 7	8 46 10 0	9 11 9 9	9 2 11 0	9 25 10 9	6° 4						
M.	19	9 32 11 3	10 10 11 0	9 38 9 6	10 10 9 3	9 55 10 6	10 33 10 2)						
Tu.	20	10 52 11 0	11 37 11 2	10 51 9 3	11 34 9 3	11 12 10 1	11 51 10 0	8° 4						
W.	21	— —	0 18 11 6	— —	0 16 9 6	— —	0 29 10 3	9° 4						
Th.	22	0 56 12 0	1 28 12 6	0 56 9 9	1 35 10 1	1 7 10 6	1 44 10 11	10° 4						
F.	23	1 57 13 2	2 24 13 9	2 10 10 6	2 39 10 11	2 20 11 4	2 53 11 9	11° 4						
S.	24	2 49 14 3	3 13 14 10	3 7 11 4	3 33 11 9	3 23 12 2	3 52 12 6	12° 4						
S.	25	3 36 15 3	3 58 15 7	3 58 12 1	4 21 12 4	4 19 12 10	4 44 13 0	13° 4						
M.	26	4 20 15 10	4 42 16 0	4 44 12 6	5 8 12 7	5 8 13 1	5 30 13 2	○						
Tu.	27	5 4 16 0	5 26 15 10	5 31 12 7	5 53 12 6	5 51 13 3	6 13 13 1	15° 4						
W.	28	5 48 15 7	6 10 15 3	6 15 12 4	6 36 12 1	6 35 13 0	6 57 12 10	16° 4						
Th.	29	6 31 14 10	6 51 14 4	6 56 11 10	7 16 11 6	7 17 12 7	7 36 12 4	17° 4						
F.	30	7 13 13 10	7 36 13 3	7 37 11 2	7 57 10 9	7 56 12 1	8 16 11 9	18° 4						
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M.D.	M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
1	3 52	Sub.	9	1 32	Sub.	17	0 31	Add.	25	2 10	Add.
2	3 34		10	1 16		18	0 45		26	2 20	
3	3 16		11	0 59		19	0 58		27	2 30	
4	2 58		12	0 44		20	1 11		28	2 39	
5	2 40		13	0 28		21	1 24		29	2 48	
6	2 23		14	0 13		22	1 36		30	2 57	
7	2 6		15	0 2	Add.	23	1 48				
8	1 49		16	0 17		24	1 59				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.
C

BRITISH AND IRISH PORTS.

MAY, 1869.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D	
S.	1	2 21 17 4	2 44 16 8	3 47 15 4	4 9 14 10	5 18 19 7	5 40 18 11	19°						
S.	2	3 7 16 1	3 31 15 6	4 32 14 4	4 57 13 9	6 4 18 3	6 28 17 8	20°						
M.	3	3 57 14 11	4 24 14 5	5 23 13 6	5 53 13 2	6 53 17 2	7 20 16 9							
Tu.	4	4 52 14 0	5 24 13 10	6 25 12 10	7 2 12 8	7 50 16 4	8 28 16 1	22°						
W.	5	5 57 13 9	6 31 14 0	7 41 12 8	8 19 12 9	9 8 16 1	9 45 16 3	23°						
Th.	6	7 7 14 4	7 39 14 9	8 56 12 11	9 32 13 2	10 22 16 6	10 59 16 10	24°						
F.	7	8 9 15 2	8 33 15 8	10 2 13 6	10 30 13 10	11 31 17 2	11 59 17 7	25°						
S.	8	8 54 16 1	9 15 16 6	10 52 14 2	11 13 14 5	— — — —	0 23 18 0	26°						
S.	9	9 35 16 10	9 55 17 3	11 31 14 9	11 49 15 0	0 43 18 5	1 2 18 9	27°						
M.	10	10 14 17 7	10 32 17 10	— — — —	0 7 15 3	1 21 19 1	1 38 19 4	28°						
Tu.	11	10 51 18 0	11 11 18 2	0 24 15 5	0 41 15 7	1 54 19 7	2 10 19 9							
W.	12	11 30 18 3	11 49 18 3	0 59 15 9	1 16 15 10	2 28 19 10	2 47 19 11	0°						
Th.	13	— — — —	0 8 18 3	1 33 15 11	1 51 15 10	3 3 19 11	3 20 20 0	1°						
F.	14	0 28 18 3	0 48 18 2	2 8 15 10	2 25 15 9	3 36 19 11	3 53 19 10	2°						
S.	15	1 9 18 0	1 30 17 10	2 42 15 8	3 0 15 6	4 12 19 9	4 31 19 8	3°						
S.	16	1 52 17 8	2 15 17 4	3 30 15 3	3 41 15 1	4 51 19 6	5 13 19 4	4°						
M.	17	2 41 17 0	3 8 16 7	4 4 14 10	4 29 14 6	5 34 19 0	5 58 18 6	5°						
Tu.	18	3 35 16 2	4 4 15 10	4 57 14 3	5 27 14 0	6 26 18 1	6 56 17 9							
W.	19	4 33 15 6	5 5 15 4	6 0 13 9	6 36 13 7	7 28 17 6	8 5 17 3	7°						
Th.	20	5 38 15 4	6 11 15 7	7 16 13 7	7 58 13 9	8 45 17 2	9 24 17 4	8°						
F.	21	6 45 16 0	7 21 16 5	8 35 14 0	9 10 14 4	10 0 17 8	10 35 18 1	9°						
S.	22	7 52 16 11	8 22 17 5	9 43 14 9	10 12 15 11	11 9 18 6	11 40 18 11	10°						
S.	23	8 51 17 10	9 17 18 3	10 40 15 5	11 7 15 8	— — — —	0 8 19 4	11°						
M.	24	9 43 18 7	10 8 18 10	11 32 15 11	11 55 16 2	0 35 19 9	1 2 20 2	12°						
Tu.	25	10 33 19 0	10 58 19 0	— — — —	0 18 16 4	1 27 20 5	1 50 20 6							
W.	26	11 23 19 0	11 47 18 11	0 42 16 5	1 5 16 5	2 13 20 7	2 35 20 7	14°						
Th.	27	— — — —	0 10 18 9	1 27 16 5	1 49 16 4	2 57 20 7	3 17 20 6	15°						
F.	28	0 32 18 6	0 55 18 2	2 9 16 2	2 29 15 11	3 39 20 3	3 58 20 1	16°						
S.	29	1 18 17 11	1 40 17 5	2 48 15 8	3 8 15 5	4 19 19 10	4 39 19 7	17°						
S.	30	2 2 17 2	2 24 16 9	3 29 15 1	3 50 14 9	4 59 19 4	5 20 18 11	18°						
M.	31	2 46 16 3	3 8 15 10	4 12 14 5	4 35 14 1	5 41 18 6	6 3 18 0	19°						
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				10ft. 1½in.				

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
1	3 4	Add.	9	3 46	Add.	17	3 50	Add.	25	3 20	Add.
2	3 11		10	3 48		18	3 48		26	3 14	
3	3 18		11	3 50		19	3 46		27	3 8	
4	3 24		12	3 52		20	3 43		28	3 1	
5	3 30		13	3 52		21	3 39		29	2 53	
6	3 34		14	3 53		22	3 35		30	2 45	
7	3 39		15	3 52		23	3 31		31	2 37	
8	3 43		16	3 52		24	3 26				

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

MAY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	4m22	3 6	10 11	3 27	10 8	9 45	19 0	10 8	18 3	6 39	12 10	7 4	12 3												
S.	2	5 13	3 49	10 4	4 12	10 1	10 33	17 7	11 2	17 0	7 29	11 11	7 56	11 4												
M.	3	6 2	4 37	9 10	5 5	9 7	11 35	16 7	—	—	8 25	11 1	8 57	10 6												
Tu.	4	6 48	5 34	9 6	6 8	9 5	0 10	16 0	0 46	15 9	9 33	10 7	10 11	10 6												
W.	5	7 33	6 48	9 5	7 28	9 6	1 21	15 7	1 55	15 8	10 47	10 6	11 21	10 8												
Th.	6	8 16	8 4	9 7	8 38	9 9	2 28	16 0	3 1	16 5	11 53	11 0	—	—												
F.	7	8 58	9 5	9 11	9 31	10 2	3 31	17 0	3 59	17 6	0 21	11 4	0 48	11 4												
S.	8	9 40	9 57	10 5	10 22	10 7	4 21	17 11	4 42	18 5	1 11	12 0	1 32	12 4												
S.	9	10 23	10 42	10 9	11 1	11 0	5 0	18 10	5 17	19 3	1 53	12 8	2 13	13 3												
M.	10	11 7	11 20	11 2	11 37	11 3	5 35	19 6	5 53	19 10	2 33	13 2	2 49	13 3												
Tu.	11	11 53	11 54	11 4	—	—	6 11	20 0	6 30	20 2	3 5	13 8	3 22	13 13												
W.	12	0a42	0 12	11 5	0 29	11 5	6 48	20 4	7 5	20 5	3 39	14 0	3 56	14 1												
Th.	13	1 33	0 46	11 5	1 4	11 5	7 23	20 6	7 41	20 5	4 13	14 2	4 30	14 1												
F.	14	2 27	1 22	11 4	1 39	11 3	7 58	20 4	8 16	20 3	4 48	14 0	5 6	13 10												
S.	15	3 22	1 57	11 2	2 17	11 0	8 35	20 0	8 56	19 8	5 25	13 8	5 46	13 3												
S.	16	4 18	2 38	10 11	2 59	10 9	9 18	19 4	9 40	19 0	6 9	13 1	6 33	12 13												
M.	17	5 14	3 21	10 7	3 46	10 6	10 4	18 7	10 33	18 2	7 0	12 7	7 29	12 3												
Tu.	18	6 9	4 12	10 4	4 40	10 2	11 5	17 9	11 42	17 5	7 59	12 0	8 32	11 16												
W.	19	7 2	5 12	10 1	5 45	10 0	—	—	0 21	17 3	9 7	11 8	9 47	11 2												
Th.	20	7 55	6 22	10 1	7 5	10 2	0 59	17 2	1 35	17 4	10 26	11 8	11 1	11 21												
F.	21	8 47	7 43	10 4	8 17	10 6	2 8	17 8	2 40	18 2	11 33	12 3	—	—												
S.	22	9 39	8 50	10 9	9 19	11 0	3 11	18 9	3 41	19 4	0 4	12 7	0 32	12 4												
S.	23	10 31	9 49	11 3	10 19	11 5	4 9	19 11	4 36	20 4	1 0	13 5	1 29	13 3												
M.	24	11 25	10 44	11 7	11 8	11 9	5 0	20 8	5 23	21 0	1 55	14 0	2 20	14 2												
Tu.	25	morn.	11 31	11 10	11 55	11 11	5 47	21 2	6 12	21 3	2 43	14 5	3 6	14 4												
W.	26	0 20	—	—	0 18	11 10	6 36	21 4	6 59	21 3	3 28	14 7	3 50	14 4												
Th.	27	1 15	0 40	11 9	1 2	11 8	7 21	21 2	7 43	20 11	4 11	14 8	4 32	14 6												
F.	28	2 10	1 23	11 6	1 43	11 4	8 2	20 8	8 22	20 3	4 52	14 3	5 12	13 11												
S.	29	3 3	2 4	11 2	2 26	11 0	8 43	19 10	9 5	19 4	5 34	13 6	5 56	13 1												
S.	30	3 54	2 47	10 9	3 9	10 7	9 27	18 10	9 48	18 4	6 18	12 9	6 41	12 3												
M.	31	4 42	3 30	10 4	3 51	10 2	10 10	17 10	10 34	17 5	7 5	12 1	7 30	11 3												
Half Mean Spring } Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.															

Half Mean Spring }
Range. } 5ft. 9in.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter-	3	1	40	Afternoon.
New - - -	11	4	7	Afternoon.
First Quarter-	18	9	30	Afternoon.
Full - - -	25	3	23	Afternoon.
In Apogee -	6	6	0	Morning.
In Perigee -	21	10	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	20	8.12	9	4	N.49	17	17	N.59	25	16	S.1
2	19	6	10	8	53	18	15	3	26	18	42
3	17	8	11	12	38	19	11	13	27	20	12
4	14	27	12	15	53	20	6	42	28	30	34
5	11	12	13	18	25	21	1	46	29	19	52
6	7	31	14	20	0	22	3	S.16	30	18	2
7	3	32	15	20	31	23	8	7	31	15	42
8	0	N.37	16	19	50	24	12	29			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MAY, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
S.	1	10 0 33 2	10 18 31 10	1 11 14 6	1 36 14 0	2 11 10 0	2 35 9 8	19.4						
M.	2	10 38 30 7	11 2 29 6	2 1 13 5	2 28 13 0	3 0 9 5	3 27 9 2	20.4						
Tu.	3	11 29 28 5	— — — —	2 58 12 7	3 32 12 3	3 57 8 11	4 30 8 8	21.4						
W.	4	0 2 27 9	0 37 27 5	4 11 12 1	4 50 12 1	5 6 8 7	5 41 8 6	22.4						
Th.	5	1 14 27 5	1 51 27 9	5 27 12 2	6 1 12 4	6 15 8 7	6 48 8 9	23.4						
F.	6	2 27 28 3	3 1 28 11	6 34 12 7	7 2 12 11	7 22 8 11	7 51 9 1	24.4						
S.	7	3 34 29 8	4 3 30 7	7 29 13 2	7 51 13 7	8 19 9 3	8 43 9 6	25.4						
M.	8	4 28 31 6	4 52 32 6	8 11 13 11	8 29 14 3	9 5 9 8	9 26 9 11	26.4						
Tu.	9	5 15 33 4	5 36 34 1	8 46 14 7	9 3 14 10	9 45 10 1	10 2 10 3	27.4						
W.	10	5 55 34 9	6 14 35 4	9 20 15 1	9 37 15 4	10 18 10 5	10 34 10 7	28.4						
Th.	11	6 34 35 8	6 53 36 0	9 54 15 5	10 11 15 7	10 51 10 8	11 8 10 9	29.4						
F.	12	7 11 36 3	7 29 36 6	10 27 15 7	10 42 15 8	11 25 10 10	11 42 10 10	0.8						
S.	13	7 46 36 5	8 4 36 4	10 58 15 7	11 15 15 7	12 0 10 9	— — — —	1.8						
M.	14	8 21 36 2	8 39 35 11	11 34 15 5	11 55 15 3	0 19 10 8	0 38 10 7	2.8						
Tu.	15	8 58 35 6	9 17 35 1	— — — —	0 17 15 1	0 58 10 6	1 19 10 3	3.8						
W.	16	9 37 34 5	9 58 33 8	0 41 14 10	1 5 14 6	1 41 10 1	2 4 9 11	4.8						
Th.	17	10 20 32 10	10 43 32 1	1 31 14 2	2 0 13 11	2 31 9 10	3 0 9 8	5.8						
F.	18	11 9 31 4	11 40 30 9	2 31 13 8	3 5 13 5	3 30 9 6	4 4 9 4	6.8						
S.	19	— — — —	0 15 30 5	3 43 13 3	4 25 13 3	4 41 9 3	5 19 9 2	7.8						
M.	20	0 52 30 7	1 29 30 11	5 6 13 5	5 41 13 8	5 56 9 3	6 28 9 5	8.8						
Tu.	21	2 6 31 6	2 42 32 4	6 13 14 0	6 44 14 4	7 0 9 8	7 31 9 11	9.8						
W.	22	3 17 33 2	3 52 34 2	7 11 14 8	7 39 15 1	8 1 10 1	8 31 10 4	10.8						
Th.	23	4 26 35 1	4 57 36 1	8 6 15 5	8 30 15 9	9 1 10 6	9 28 10 9	11.8						
F.	24	5 24 36 10	5 51 37 4	8 52 16 0	9 14 16 2	9 51 10 11	10 13 11 0	12.8						
S.	25	6 17 37 8	6 41 37 9	9 37 16 3	10 0 16 4	10 35 11 1	10 57 11 2	13.8						
M.	26	7 4 37 10	7 26 37 10	10 21 16 3	10 41 16 2	11 18 11 2	11 40 11 1	14.8						
Tu.	27	7 48 37 5	8 8 36 11	11 0 16 0	11 19 15 9	— — — —	0 2 10 11	15.8						
W.	28	8 27 36 3	8 47 35 8	11 40 15 6	— — — —	0 23 10 10	0 44 10 8	16.8						
Th.	29	9 7 35 9	9 26 34 2	0 3 15 2	0 26 14 10	1 6 10 5	1 28 10 2	17.8						
F.	30	9 44 33 3	10 1 32 4	0 50 14 5	1 13 14 0	1 51 9 11	2 13 9 8	18.8						
S.	31	10 19 31 5	10 38 30 6	1 37 13 8	2 2 13 4	2 36 9 6	3 0 9 4	19.8						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	3	4		9	3	46		17	3	50		25	3	20	
2	3	11		10	3	48		18	3	48		26	3	14	
3	3	18		11	3	50		19	3	46		27	3	8	
4	3	24		12	3	52		20	3	43		28	3	1	
5	3	30		13	3	52		21	3	39		29	2	53	
6	3	34		14	3	53		22	3	35		30	2	45	
7	3	39		15	3	52		23	3	31		31	2	37	
8	3	43		16	3	52		24	3	26					

TIDE TABLES FOR THE

MAY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	
S.	1	4 m 22	3	5	9	3	3	28	9	1	2	15	23	7	2	37	22	9	9	28	18	3	9	49	17	
S.	2	5 13	3	50	8	10	4	14	8	8	3	0	21	10	3	25	21	0	10	11	16	9	10	35	16	
M.	3	6 2	4	40	8	6	5	9	8	3	3	53	20	4	4	25	19	8	11	0	15	5	11	28	15	
Tu.	4	6 48	5	42	8	2	6	18	8	0	5	2	19	3	5	41	19	2	—	—	—	0	1	14	—	
W.	5	7 33	6	54	7	11	7	30	8	0	6	22	19	4	7	0	19	7	0	36	14	9	1	15	14	
Th.	6	8 16	8	5	8	2	8	37	8	3	7	35	20	1	8	5	20	8	1	54	15	3	2	28	15	
F.	7	8 58	9	6	8	5	9	31	8	7	8	32	21	3	8	55	21	10	3	0	16	4	3	26	16	
S.	8	9 40	9	53	8	9	10	13	8	11	9	15	22	6	9	33	23	1	3	50	17	7	4	12	18	
S.	9	10 23	10	32	9	0	10	52	9	1	9	50	23	7	10	8	24	0	4	34	18	8	4	55	19	
M.	10	11 7	11	10	9	3	11	29	9	4	10	25	24	5	10	43	24	9	5	14	19	6	5	33	19	
Tu.	11	11 53	11	48	9	5	—	—	—	—	11	1	25	0	11	19	25	3	5	52	20	1	6	11	20	
W.	12	0 42	0	7	9	6	0	25	9	6	11	35	25	4	11	55	25	5	6	28	20	5	6	46	20	
Th.	13	1 33	0	43	9	7	1	1	9	7	—	—	—	—	0	12	25	5	7	3	20	6	7	20	20	
F.	14	2 27	1	20	9	7	1	38	9	7	0	30	25	4	0	48	25	2	7	38	20	3	7	57	20	
S.	15	3 22	1	57	9	6	2	17	9	5	1	7	24	11	1	27	24	6	8	18	19	9	8	40	19	
S.	16	4 18	2	38	9	4	3	0	9	3	1	48	24	1	2	10	23	7	9	2	19	0	9	25	18	
M.	17	5 14	3	23	9	2	3	47	9	0	2	34	23	1	3	0	22	7	9	50	18	1	10	16	17	
Tu.	18	6 9	4	17	8	11	4	48	8	10	3	28	22	0	4	0	21	7	10	42	17	2	11	10	16	
W.	19	7 2	5	20	8	8	5	55	8	7	4	35	21	3	5	16	21	2	11	41	16	7	—	—	—	
Th.	20	7 55	6	33	8	7	7	9	8	7	5	58	21	4	6	38	21	9	0	15	16	8	0	51	16	
F.	21	8 47	7	44	8	9	8	18	8	11	7	13	22	4	7	47	23	0	1	31	17	3	2	10	17	
S.	22	9 39	8	49	9	1	9	19	9	3	8	16	23	8	8	43	24	4	2	43	18	6	3	15	19	
S.	23	10 31	9	48	9	5	10	14	9	7	9	9	24	11	9	34	25	6	3	46	19	9	4	16	20	
M.	24	11 25	10	40	9	8	11	5	9	9	9	56	25	11	10	19	26	3	4	43	20	9	5	9	21	
Tu.	25	morn.	11	30	9	9	11	54	9	10	10	44	26	4	11	8	26	5	5	35	21	3	5	59	21	
W.	26	0 20	—	—	—	—	0	18	9	10	11	30	26	6	11	52	26	5	6	22	21	5	6	44	21	
Th.	27	1 15	0	41	9	10	1	3	9	9	—	—	—	—	0	14	26	1	7	4	21	1	7	24	20	
F.	28	2 10	1	24	9	8	1	44	9	7	0	35	25	9	0	55	25	3	7	44	20	3	8	5	19	
S.	29	3 3	2	5	9	6	2	26	9	4	1	16	24	8	1	36	24	1	8	26	19	4	8	48	18	
S.	30	3 54	2	47	9	2	3	7	9	0	1	57	23	5	2	18	22	9	9	9	18	3	9	29	17	
M.	31	4 42	3	28	8	11	3	50	8	9	2	39	22	2	3	1	21	7	9	50	17	2	10	11	16	
Half Mean Spring Range.			4ft. 10in.								13ft. 0in.								10ft. 6in.							

Phases of the Moon.				Moon's Declination at Noon.															
	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Last Quarter -	3	1	40	Afternoon.	1	20	S. 12		9	4	N. 49		17	17	N. 59		25	16	S. 5
New - - - - -	11	4	7	Afternoon.	2	19	6		10	8	53		18	15	3		26	18	42
First Quarter -	18	9	30	Afternoon.	3	17	8		11	12	38		19	11	13		27	20	12
Full - - - - -	25	3	23	Afternoon.	4	14	27		12	15	53		20	6	42		28	20	34
					5	11	12		13	18	25		21	1	46		29	19	53
In Apogee - -	6	6	0	Morning.	6	7	31		14	20	0		22	3	S. 16		30	18	9
In Perigee - -	21	10	0	Afternoon.	7	3	32		15	20	31		23	8	7		31	15	42
					8	0	N. 37		16	19	50		24	12	29				

he times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

MAY, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
S.	1	10	0	33	2	10	18	31	10	1	11	14	6	1	36	14	0	2	11	10	0	2	35	9	8	19.4
S.	2	10	38	30	7	11	2	29	6	2	1	13	5	2	28	13	0	3	0	9	5	3	27	9	2	20.4
M.	3	11	29	28	5	—	—	—	—	2	58	12	7	3	32	12	3	3	57	8	11	4	30	8	8	—
Tu.	4	0	2	27	5	0	37	27	5	4	11	12	1	4	50	12	1	5	6	8	7	5	41	8	6	22.4
W.	5	1	14	27	5	1	51	27	9	5	27	12	2	6	1	12	4	6	15	8	7	6	48	8	9	23.4
Th.	6	2	27	28	3	3	1	28	11	6	34	12	7	7	2	12	11	7	22	8	11	7	51	9	1	24.4
F.	7	3	34	29	8	4	3	30	7	7	29	13	2	7	51	13	7	8	19	9	3	8	43	9	6	25.4
S.	8	4	28	31	6	4	52	32	6	8	11	13	11	8	29	14	3	9	5	9	8	9	26	9	11	26.4
S.	9	5	15	33	4	5	36	34	1	8	46	14	7	9	3	14	10	9	45	10	1	10	2	10	3	27.4
M.	10	5	55	34	5	6	14	35	4	9	20	15	1	9	37	15	4	10	18	10	5	10	34	10	7	28.4
Tu.	11	6	34	35	8	6	53	36	0	9	54	15	5	10	11	15	7	10	51	10	8	11	8	10	9	—
W.	12	7	11	36	3	7	29	36	6	10	27	15	7	10	42	15	8	11	25	10	10	11	42	10	10	0.8
Th.	13	7	46	36	5	8	4	36	4	10	58	15	7	11	15	15	7	12	0	10	9	—	—	—	—	1.8
F.	14	8	21	36	2	8	39	35	11	11	34	15	5	11	55	15	3	0	19	10	8	0	38	10	7	2.8
S.	15	8	58	35	6	9	17	35	1	—	—	—	—	0	17	15	1	0	58	10	6	1	19	10	3	3.8
S.	16	9	37	34	5	9	58	33	8	0	41	14	10	1	5	14	6	1	41	10	1	2	4	9	11	4.8
M.	17	10	20	32	10	10	43	32	1	1	31	14	2	2	0	13	11	2	31	9	10	3	0	9	8	5.8
Tu.	18	11	9	31	4	11	40	30	9	2	31	13	8	3	5	13	5	3	30	9	6	4	4	9	4	—
W.	19	—	—	—	—	0	15	30	5	3	43	13	3	4	25	13	3	4	41	9	3	5	19	9	2	7.8
Th.	20	0	52	30	7	1	29	30	11	5	6	13	5	5	41	13	8	5	56	9	3	6	28	9	5	8.8
F.	21	2	6	31	6	2	42	32	4	6	13	14	0	6	44	14	4	7	0	9	8	7	31	9	11	9.8
S.	22	3	17	33	2	3	52	34	2	7	11	14	8	7	39	15	1	8	1	10	1	8	31	10	4	10.8
S.	23	4	26	35	1	4	57	36	1	8	6	15	5	8	30	15	9	9	1	10	6	9	28	10	9	11.8
M.	24	5	24	36	10	5	51	37	4	8	52	16	0	9	14	16	2	9	51	10	11	10	13	11	0	12.8
Tu.	25	6	17	37	8	6	41	37	9	9	37	16	3	10	0	16	4	10	35	11	1	10	57	11	2	—
W.	26	7	4	37	10	7	26	37	10	10	21	16	3	10	41	16	2	11	18	11	2	11	40	11	1	14.8
Th.	27	7	48	37	5	8	8	36	11	11	0	16	0	11	19	15	9	—	—	—	—	0	2	10	11	15.8
F.	28	8	27	36	3	8	47	35	8	11	40	15	6	—	—	—	—	0	23	10	10	0	44	10	8	16.8
S.	29	9	7	35	0	9	26	34	2	0	3	15	2	0	26	14	10	1	6	10	5	1	28	10	2	17.8
S.	30	9	44	33	3	10	1	32	4	0	50	14	5	1	13	14	0	1	51	9	11	2	13	9	8	18.8
M.	31	10	19	31	5	10	38	30	6	1	37	13	8	2	2	13	4	2	36	9	6	3	0	9	4	19.8
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	3	4		9	3	46		17	3	50		25	3	20	
2	3	11		10	3	48		18	3	48		26	3	14	
3	3	18		11	3	50		19	3	46		27	3	8	
4	3	24		12	3	52		20	3	43		28	3	1	
5	3	30		13	3	52		21	3	39		29	2	53	
6	3	34		14	3	53		22	3	35		30	2	45	
7	3	39		15	3	52		23	3	31		31	2	37	
8	3	43		16	3	52		24	3	26					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.						
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
S.	1	4m22	1	50	9	0	2	16	8	9	11	16	6	4	11	48	6	0	8	36	9	3	9	3	8	11				
S.	2	5 13	2	42	8	6	3	9	8	4	—	—	0	22	5	8	9	33	8	6	10	6	8	3						
M.	3	6 2	3	40	8	2	4	12	8	0	1	0	5	6	1	40	5	4	10	41	8	1	11	19	8	0				
Tu.	4	6 48	4	47	7	11	5	22	7	11	2	23	5	4	3	0	5	5	11	56	7	11	—	—						
W.	5	7 33	5	57	7	10	6	32	7	10	3	34	5	7	4	5	5	9	0	31	8	0	1	6	8	1				
Th.	6	8 16	7	6	7	11	7	36	8	0	4	33	6	0	4	57	6	2	1	40	8	3	2	9	8	6				
F.	7	8 58	8	3	8	2	8	25	8	4	5	19	6	4	5	37	6	5	2	35	8	10	2	56	9	1				
S.	8	9 40	8	44	8	7	9	3	8	9	5	55	6	7	6	13	6	9	3	15	9	5	3	32	9	8				
S.	9	10 23	9	21	8	11	9	39	9	0	6	32	6	11	6	51	7	1	3	48	10	0	4	5	10	3				
M.	10	11 7	9	56	9	2	10	13	9	3	7	8	7	3	7	26	7	4	4	22	10	6	4	39	10	8				
Tu.	11	11 53	10	30	9	3	10	47	9	4	7	44	7	5	8	1	7	6	4	57	10	10	5	15	10	11				
W.	12	0a42	11	4	9	4	11	20	9	4	8	17	7	7	8	33	7	7	5	33	11	0	5	50	11	0				
Th.	13	1 33	11	36	9	3	11	54	9	3	8	49	7	6	9	5	7	5	6	7	10	11	6	24	10	10				
F.	14	2 27	—	—	—	—	0	13	9	3	9	22	7	3	9	40	7	2	6	43	10	8	7	3	10	6				
S.	15	3 22	0	34	9	2	0	56	9	1	9	59	7	0	10	20	6	10	7	23	10	3	7	45	10	0				
S.	16	4 18	1	19	9	0	1	44	8	11	10	42	6	8	11	11	6	5	8	6	9	8	8	32	9	5				
M.	17	5 14	2	12	8	10	2	43	8	8	11	47	6	3	—	—	—	—	9	2	9	2	9	36	9	0				
Tu.	18	6 9	3	14	8	6	3	47	8	5	0	25	6	0	1	7	5	10	10	13	8	10	10	52	8	9				
W.	19	7 2	4	22	8	5	5	0	8	4	1	52	5	11	2	37	6	0	11	33	8	10	—	—						
Th.	20	7 55	5	37	8	4	6	11	8	5	3	15	6	2	3	46	6	5	0	10	8	11	0	45	9	1				
F.	21	8 47	6	45	8	6	7	18	8	7	4	15	6	9	4	40	6	11	1	18	9	3	1	50	9	7				
S.	22	9 39	7	46	8	9	8	13	8	11	5	2	7	1	5	25	7	3	2	18	9	11	2	44	10	2				
S.	23	10 31	8	39	9	2	9	4	9	4	5	50	7	5	6	14	7	7	3	9	10	6	3	32	10	10				
M.	24	11 25	9	27	9	5	9	50	9	6	6	38	7	9	7	2	7	10	3	54	11	1	4	16	11	3				
Tu.	25	morn.	10	13	9	7	10	35	9	7	7	26	7	10	7	50	7	11	4	40	11	5	5	4	11	6				
W.	26	0 20	10	57	9	7	11	18	9	6	8	12	7	11	8	31	7	10	5	27	11	6	5	48	11	5				
Th.	27	1 15	11	38	9	5	11	58	9	4	8	50	7	8	9	9	7	6	6	8	11	3	6	28	11	0				
F.	28	2 10	—	—	—	—	0	19	9	3	9	28	7	3	9	48	7	1	6	49	10	8	7	10	10	4				
S.	29	3 3	0	42	9	2	1	5	9	0	10	8	6	10	10	30	6	8	7	31	10	0	7	53	9	8				
S.	30	3 54	1	29	8	11	1	53	8	9	10	52	6	5	11	17	6	2	8	15	9	4	8	37	9	0				
M.	31	4 42	2	18	8	7	2	44	8	5	11	48	5	11	—	—	—	—	9	3	8	9	9	31	8	6				

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	3	1	40	Afternoon.
New - - - - -	11	4	7	Afternoon.
First Quarter -	18	9	30	Afternoon.
Full - - - - -	25	3	23	Afternoon.
In Apogee - -	6	6	0	Morning.
In Perigee - -	21	10	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	20	8.12	9	4	N.49	17	17	N.59	25	16	8.5
2	19	6	10	8	53	18	15	3	26	18	42
3	17	8	11	12	38	19	11	13	27	20	12
4	14	27	12	15	53	20	6	42	28	20	34
5	11	12	13	18	25	21	1	46	29	19	50
6	7	31	14	20	0	22	3	8.16	30	18	9
7	3	32	15	20	31	23	8	7	31	15	42
8	0	N.37	16	19	50	24	12	29			

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

MAY, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.		D.
S.	1	8 0 12 8		8 25 11 11		8 18 10 4		8 40 9 11		8 36 11 4		8 56 10 11		19° 4
S.	2	8 51 11 4		9 19 10 11		9 3 9 7		9 27 9 3		9 18 10 7		9 43 10 3		20° 4
M.	3	9 51 10 6		10 27 10 3		9 54 9 0		10 26 8 10		10 14 9 11		10 48 9 8		(
Tu.	4	11 5 10 3		11 42 10 4		11 3 8 9		11 40 8 8		11 23 9 6		11 56 9 5		22° 4
W.	5	— —		0 18 10 6		— —		0 16 8 10		— —		0 29 9 7		23° 4
Th.	6	0 52 10 10		1 20 11 2		0 51 9 0		1 25 9 3		1 2 9 9		1 33 9 11		24° 4
F.	7	1 46 11 6		2 8 11 11		1 56 9 5		2 22 9 9		2 4 10 2		2 33 10 6		25° 5
S.	8	2 29 12 3		2 48 12 8		2 44 10 0		3 5 10 3		2 58 10 9		3 21 11 0		26° 4
S.	9	3 7 13 0		3 25 13 4		3 25 10 6		3 45 10 9		3 43 11 3		4 4 11 6		27° 4
M.	10	3 42 13 7		3 59 13 10		4 4 11 0		4 22 11 2		4 24 11 9		4 44 11 11		28° 4
Tu.	11	4 17 14 1		4 34 14 3		4 41 11 3		4 59 11 5		5 4 12 0		5 22 12 0		●
W.	12	4 51 14 5		5 9 14 6		5 17 11 7		5 36 11 6		5 38 12 1		5 56 12 2		0° 8
Th.	13	5 27 14 5		5 45 14 4		5 54 11 6		6 12 11 6		6 14 12 2		6 33 12 2		1° 8
F.	14	6 4 14 3		6 23 14 1		6 30 11 5		6 49 11 3		6 51 12 1		7 10 12 1		2° 8
S.	15	6 44 13 10		7 7 13 6		7 9 11 1		7 30 10 11		7 30 12 0		7 51 11 10		3° 8
S.	16	7 30 13 3		7 56 12 11		7 52 10 9		8 15 10 6		8 12 11 8		8 34 11 6		4° 8
M.	17	8 25 12 5		8 55 12 0		8 40 10 3		9 7 10 0		8 57 11 3		9 22 11 0		5° 8
Tu.	18	9 26 11 9		10 1 11 6		9 35 9 10		10 4 9 8		9 50 10 10		10 24 10 8)
W.	19	10 41 11 7		11 21 11 9		10 40 9 8		11 18 9 8		11 1 10 6		11 36 10 5		7° 8
Th.	20	11 57 12 0		— —		11 55 9 9		— —		— —		0 9 10 6		8° 8
F.	21	0 30 12 4		1 2 12 8		0 31 10 0		1 6 10 3		0 42 10 9		1 15 11 0		9° 8
S.	22	1 29 13 2		1 56 13 7		1 39 10 6		2 11 10 10		1 48 11 3		2 22 11 7		10° 8
S.	23	2 23 13 11		2 50 14 3		2 41 11 1		3 8 11 4		2 55 11 10		3 26 12 2		11° 8
M.	24	3 13 14 7		3 36 14 10		3 34 11 7		3 59 11 9		3 54 12 4		4 20 12 6		12° 8
Tu.	25	4 0 15 0		4 23 15 1		4 23 11 11		4 47 11 11		4 46 12 7		5 10 12 7		○
W.	26	4 45 15 2		5 7 15 1		5 10 12 0		5 33 11 11		5 32 12 7		5 54 12 7		14° 8
Th.	27	5 28 14 11		5 49 14 7		5 55 11 10		6 16 11 8		6 16 12 6		6 37 12 4		15° 8
F.	28	6 10 14 3		6 32 13 11		6 37 11 5		6 58 11 2		6 58 12 2		7 19 12 0		16° 8
S.	29	6 54 13 6		7 16 13 1		7 19 10 11		7 40 10 8		7 39 11 10		7 59 11 7		17° 8
S.	30	7 38 12 8		8 1 12 3		8 0 10 4		8 20 10 1		8 18 11 4		8 38 11 1		18° 8
M.	31	8 25 11 9		8 50 11 4		8 40 9 10		9 2 9 7		8 58 10 10		9 17 10 7		19° 8
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	3 4		9	3 46		17	3 50		25	3 20	
2	3 11		10	3 48		18	3 48		26	3 14	
3	3 18		11	3 50		19	3 46		27	3 8	
4	3 24		12	3 52		20	3 43		28	3 1	
5	3 30		13	3 52		21	3 39		29	2 53	
6	3 34		14	3 53		22	3 35		30	2 45	
7	3 39		15	3 52		23	3 31		31	2 37	
8	3 43		16	3 52		24	3 26				

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

JUNE, 1869.

Phases of the Moon.				Moon's Declination at Noon.												
	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	2	7	21	Morning.	1	12	S. 33	9	17	N. 43	17	3	N. 9	25	20	S. 18
New- - - - -	10	3	52	Morning.	2	8	58	10	19	42	18	1	S. 49	26	18	58
First Quarter-	17	2	15	Morning.	3	5	3	11	20	35	19	6	40	27	16	45
Full - - - - -	24	1	39	Morning.	4	0	55	12	20	16	20	11	8	28	13	50
					5	3	N. 18	13	18	42	21	14	57	29	10	22
In Apogee - -	2	12	0	Midnight.	6	7	27	14	16	0	22	17	54	30	6	32
In Perigee - -	16	10	0	Morning.	7	11	22	15	12	20	23	19	49			
In Apogee - -	30	6	0	Afternoon.	8	14	52	16	7	57	24	20	37			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
BREX add 18 m. | **DEVONPORT** add 17 m. | **PORSMOUTH** add 4 m.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C'S AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.	
Tu.	1	3	30	15	5	3	53	15	1	4	58	13	9	5	23	13	6	6	27	17	6	6	52	17	2	20.8	
W.	2	4	17	14	8	4	43	14	5	5	50	13	3	6	18	13	0	7	17	16	10	7	45	16	7	(
Th.	3	5	11	14	3	5	40	14	2	6	49	12	10	7	23	12	10	8	16	16	4	8	51	16	4	22.8	
F.	4	6	8	14	3	6	37	14	6	7	59	12	11	8	33	13	1	9	26	16	5	9	58	16	8	23.8	
S.	5	7	8	14	10	7	38	15	3	9	6	13	4	9	34	13	7	10	27	16	11	10	57	17	3	24.8	
S.	6	8	6	15	7	8	30	15	11	10	0	13	10	10	26	14	1	11	27	17	7	11	55	17	11	25.8	
M.	7	8	51	16	3	9	13	16	8	10	49	14	4	11	10	14	7	—	—	—	—	0	19	18	3	26.8	
Tu.	8	9	36	17	0	9	58	17	4	11	30	14	10	11	50	15	1	0	40	18	7	1	1	18	11	27.8	
W.	9	10	19	17	6	10	40	17	9	—	—	—	—	0	10	15	3	1	22	19	2	1	41	19	5	28.8	
Th.	10	11	2	18	0	11	25	18	2	0	29	15	5	0	49	15	7	2	1	19	7	2	20	19	8	●	
F.	11	11	48	18	3	—	—	—	—	1	9	15	9	1	30	15	10	2	40	19	9	3	0	19	10	1	3
S.	12	0	10	18	3	0	32	18	4	1	51	15	10	2	10	15	10	3	19	19	11	3	40	19	11	2.3	
S.	13	0	56	18	3	1	20	18	2	2	30	15	9	2	50	15	9	4	0	19	11	4	20	19	10	3.3	
M.	14	1	45	18	1	2	10	17	11	3	11	15	7	3	34	15	5	4	42	19	9	5	5	19	8	4.3	
Tu.	15	2	35	17	8	3	1	17	4	3	59	15	3	4	23	15	0	5	29	19	6	5	53	19	2	5.3	
W.	16	3	28	17	0	3	56	16	8	4	50	14	9	5	19	14	6	6	21	18	9	6	49	18	4	6.3	
Th.	17	4	25	16	4	4	52	16	0	5	50	14	4	6	23	14	2	7	18	18	1	7	50	17	10)	
F.	18	5	20	15	11	5	49	15	10	6	57	14	0	7	32	14	0	8	24	17	8	9	0	17	7	8.3	
S.	19	6	18	15	11	6	52	16	2	8	10	14	1	8	43	14	3	9	35	17	9	10	8	18	0	9.3	
S.	20	7	26	16	6	7	57	16	9	9	16	14	6	9	49	14	9	10	42	18	3	11	15	18	6	10.3	
M.	21	8	27	17	1	8	56	17	4	10	18	14	11	10	46	15	2	11	45	18	9	—	—	—	—	11.3	
Tu.	22	9	24	17	7	9	51	17	9	11	13	15	4	11	39	15	6	0	14	19	1	0	41	19	5	12.3	
W.	23	10	17	18	0	10	42	18	1	—	—	—	—	0	4	15	8	1	8	19	8	1	34	19	9	13.3	
Th.	24	11	7	18	1	11	31	18	1	0	28	15	9	0	51	15	10	1	58	19	10	2	21	19	11	○	
F.	25	11	54	18	0	—	—	—	—	1	13	15	10	1	34	15	10	2	44	19	11	3	4	19	10	15.3	
S.	26	0	16	17	11	0	37	17	10	1	55	15	8	2	14	15	6	3	24	19	9	3	44	19	8	16.3	
S.	27	0	57	17	8	1	18	17	6	2	33	15	5	2	51	15	3	4	4	19	6	4	22	19	4	17.3	
M.	28	1	39	17	3	1	59	17	1	3	9	15	1	3	28	14	11	4	42	19	3	5	0	19	1	18.3	
Tu.	29	2	20	16	10	2	41	16	6	3	48	14	8	4	9	14	6	5	18	18	11	5	37	18	7	19.3	
W.	30	3	1	16	2	3	21	15	10	4	29	14	3	4	50	14	0	5	57	18	3	6	19	17	10	20.3	
Half Mean Spring Range.		9ft. 4in.								8ft. 0in.								10ft. 1½ in.									

Equation of Time at Noon.

M. D.	M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
1	2 28	Add.	9	1 4	Add.	17	0 36	Sub.	25	2 18	Sub.
2	2 19		10	0 52		18	0 49		26	2 31	
3	2 9		11	0 40		19	1 1		27	2 43	
4	1 59		12	0 28		20	1 14		28	2 56	
5	1 49		13	0 15		21	1 27		29	3 8	
6	1 38		14	0 3		22	1 40		30	3 19	
7	1 27		15	0 10	Sub.	23	1 53				
8	1 16		16	0 23		24	2 6				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Tu.	1	5m 28	4 13	10 0	4 36	9 10	11 1	16 11	11 31	16 7	7 55	11 5	8 22	11 2
W.	2	6 12	5 2	9 8	5 28	9 7	—	—	0 2	16 3	8 50	11 0	9 20	10 10
Th.	3	6 54	5 56	9 7	6 29	9 7	0 34	16 0	1 6	16 0	9 54	10 9	10 27	10 9
F.	4	7 36	7 7	9 8	7 40	9 9	1 37	16 0	2 6	16 2	10 58	10 11	11 26	11 1
S.	5	8 18	8 11	9 10	8 40	10 0	2 34	16 6	3 2	17 0	11 54	11 4	—	—
S.	6	9 1	9 8	10 2	9 34	10 4	3 29	17 6	3 55	17 11	0 20	11 8	0 45	12 0
M.	7	9 47	9 58	10 6	10 20	10 8	4 18	18 3	4 39	18 8	1 8	12 3	1 30	12 6
Tu.	8	10 34	10 40	10 10	11 1	11 0	4 58	19 0	5 18	19 4	1 51	12 9	2 13	13 0
W.	9	11 25	11 22	11 2	11 42	11 3	5 38	19 7	5 58	19 9	2 34	13 3	2 54	13 5
Th.	10	0a 19	—	—	0 2	11 4	6 19	20 0	6 40	20 2	3 13	13 8	3 32	13 10
F.	11	1 15	0 22	11 4	0 42	11 5	7 1	20 4	7 22	20 5	3 52	14 0	4 12	14 1
S.	12	2 12	1 3	11 4	1 24	11 4	7 43	20 5	8 3	20 5	4 32	14 1	4 53	14 1
S.	13	3 9	1 45	11 3	2 6	11 2	8 24	20 4	8 46	20 2	5 14	13 11	5 36	13 9
M.	14	4 5	2 28	11 1	2 52	11 0	9 10	19 11	9 36	19 7	6 0	13 6	6 26	13 4
Tu.	15	5 0	3 17	10 11	3 41	10 9	9 59	19 3	10 26	19 0	6 53	13 1	7 22	12 10
W.	16	5 52	4 6	10 8	4 33	10 6	10 55	18 7	11 30	18 3	7 51	12 7	8 22	12 5
Th.	17	6 43	5 3	10 5	5 34	10 4	—	—	0 8	18 0	8 55	12 3	9 28	12 1
F.	18	7 34	6 5	10 4	6 38	10 4	0 42	17 10	1 15	17 9	10 3	12 1	10 38	12 1
S.	19	8 25	7 18	10 5	7 51	10 6	1 47	17 10	2 16	18 0	11 9	12 2	11 39	13 4
S.	20	9 17	8 24	10 7	8 56	10 9	2 46	18 5	3 16	18 10	—	—	0 9	12 7
M.	21	10 10	9 25	10 11	9 55	11 1	3 46	19 2	4 15	19 6	0 37	12 11	1 5	13 2
Tu.	22	11 4	10 24	11 2	10 50	11 3	4 43	19 9	5 8	20 0	1 34	13 4	2 2	13 6
W.	23	11 58	11 16	11 5	11 41	11 6	5 32	20 2	5 56	20 3	2 28	13 8	2 52	13 9
Th.	24	morn.	—	—	0 4	11 6	6 20	20 3	6 44	20 3	3 15	13 10	3 36	13 11
F.	25	0 52	0 26	11 5	0 47	11 4	7 7	20 3	7 28	20 2	3 57	13 11	4 18	13 11
S.	26	1 44	1 8	11 3	1 29	11 2	7 48	20 1	8 7	19 11	4 38	13 10	4 57	13 8
S.	27	2 34	1 48	11 1	2 7	10 11	8 25	19 8	8 44	19 5	5 16	13 5	5 35	13 2
M.	28	3 21	2 27	10 9	2 46	10 8	9 4	19 1	9 24	18 9	5 55	12 11	6 16	12 8
Tu.	29	4 6	3 6	10 6	3 26	10 5	9 44	18 5	10 4	18 1	6 38	12 5	7 0	12 5
W.	30	4 49	3 46	10 3	4 6	10 1	10 25	17 9	10 47	17 5	7 22	12 0	7 43	11 9

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	2	7	21	Morning.
New - - - -	10	3	52	Morning.
First Quarter	17	2	15	Morning.
Full - - - -	24	1	39	Morning.
<hr/>				
In Apogee - -	2	12	0	Midnight.
In Perigee - -	16	10	0	Morning.
In Apogee - -	30	6	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	12	S. 33	9	17	N. 43	17	3	N. 9	25	20	S. 15
2	8	58	10	19	42	18	18	S. 49	26	18	58
3	5	3	11	20	35	19	6	40	27	16	45
4	0	55	12	20	16	20	11	8	28	13	50
5	3	N. 18	13	18	42	21	14	57	29	10	22
6	7	27	14	16	0	22	17	54	30	6	52
7	11	22	15	12	20	23	19	49			
8	14	52	16	7	57	24	20	37			

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — for
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				D.					
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.							
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.						
Tu.	1	7	59	10	3	8	28	9	11	6	54	13	0	7	23	12	9	0	46	9	11	1	14	9	8	20.8					
W.	2	8	58	9	9	9	31	9	8	7	53	12	6	8	24	12	4	1	43	9	5	2	15	9	4	19.8					
Th.	3	10	7	9	8	10	40	9	9	8	59	12	4	9	34	12	4	2	51	9	0	3	30	9	3	22.8					
F.	4	11	10	9	11	11	39	10	1	10	5	12	6	10	33	12	8	4	3	9	4	4	33	9	5	23.8					
S.	5	—	—	—	—	0	8	10	4	11	1	12	11	11	27	13	2	5	2	9	7	5	29	9	10	24.8					
S.	6	0	34	10	7	0	57	10	10	11	51	13	6	—	—	—	—	5	53	10	2	6	15	10	6	25.8					
M.	7	1	19	11	1	1	38	11	4	0	13	13	9	0	32	14	1	6	33	10	11	6	50	11	3	26.8					
Tu.	8	1	57	11	7	2	17	11	11	0	51	14	5	1	12	14	10	7	8	11	8	7	25	12	1	27.8					
W.	9	2	36	12	2	2	55	12	4	1	32	15	2	1	52	15	5	7	42	12	4	8	0	12	7	28.8					
Th.	10	3	13	12	7	3	32	12	9	2	11	15	7	2	31	15	10	8	19	12	10	8	38	12	11	29.8					
F.	11	3	53	12	10	4	13	12	11	2	50	15	11	3	10	15	11	8	58	12	11	9	18	12	10	1.3					
S.	12	4	34	12	10	4	55	12	9	3	30	15	10	3	50	15	9	9	39	12	9	10	1	12	8	2.3					
S.	13	5	17	12	8	5	40	12	6	4	12	15	8	4	35	15	6	10	25	12	6	10	50	12	3	3.3					
M.	14	6	5	12	4	6	30	12	2	4	59	15	4	5	24	15	2	11	16	12	0	11	43	11	9	4.3					
Tu.	15	6	55	12	0	7	23	11	10	5	50	15	0	6	20	14	8	—	—	—	0	11	11	6	5.3						
W.	16	7	53	11	6	8	28	11	2	6	50	14	4	7	22	14	1	0	41	11	3	1	14	11	0	6.3					
Th.	17	9	4	11	0	9	39	10	11	7	58	13	11	8	32	13	9	1	48	10	10	2	23	10	8	7.3					
F.	18	10	16	10	11	10	50	11	0	9	8	13	9	9	45	13	9	3	0	10	8	3	41	10	8	8.3					
S.	19	11	21	11	2	11	53	11	5	10	15	13	11	10	46	14	1	4	14	10	8	4	47	10	9	9.3					
S.	20	—	—	—	—	0	23	11	7	11	16	14	3	11	43	14	6	5	18	10	11	5	45	11	2	10.3					
M.	21	0	49	11	9	1	16	11	11	—	—	—	—	0	10	14	9	6	12	11	6	6	36	11	10	11.3					
Tu.	22	1	42	12	1	2	7	12	4	0	36	15	0	1	1	15	4	6	59	12	2	7	30	12	5	12.3					
W.	23	2	31	12	6	2	53	12	8	1	26	15	7	1	50	15	9	7	41	12	9	8	2	12	10	13.3					
Th.	24	3	15	12	9	3	37	12	10	2	13	15	10	2	35	15	11	8	23	12	11	8	43	12	10	14.3					
F.	25	3	58	12	10	4	19	12	9	2	55	15	11	3	15	15	9	9	3	12	9	9	23	12	7	15.3					
S.	26	4	39	12	7	5	0	12	4	3	34	15	7	3	54	15	4	9	44	12	4	10	4	12	2	16.3					
S.	27	5	19	12	2	5	39	12	0	4	13	15	2	4	33	14	11	10	24	11	11	10	44	11	7	17.3					
M.	28	5	59	11	9	6	19	11	7	4	53	14	8	5	13	14	6	11	5	11	4	11	27	11	1	18.3					
Tu.	29	6	40	11	5	7	1	11	2	5	35	14	3	5	57	14	0	11	49	10	10	—	—	—	—	19.3					
W.	30	7	23	10	11	7	46	10	8	6	20	13	8	6	42	13	5	0	11	10	6	0	34	10	3	20.3					
Half Mean Spring Range.		6ft. 8in.										8ft. 2in.										6ft. 7in.									

Half Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SURREY add 6 m. LONDON add 13 m. THURSDAY add 14 m.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Tu.	1	5m28	4 13	8 8	4 38	8 6	3 24	21 0	3 50	20 6	10 33	16 3	10 54	15 9												
W.	2	6 12	5 3	8 5	5 30	8 3	4 17	20 1	4 48	19 9	11 18	15 5	11 47	15 3												
Th.	3	6 54	6 2	8 2	6 35	8 2	5 23	19 8	6 0	19 9	—	—	0 17	15 3												
F.	4	7 36	7 6	8 1	7 36	8 2	6 35	20 0	7 6	20 4	0 48	15 3	1 21	15 6												
S.	5	8 18	8 6	8 4	8 35	8 6	7 36	20 9	8 4	21 3	1 55	15 11	2 27	16 4												
S.	6	9 1	9 3	8 7	9 28	8 9	8 29	21 9	8 52	22 3	2 57	16 10	3 23	17 4												
M.	7	9 47	9 50	8 10	10 11	8 11	9 12	22 9	9 32	23 3	3 47	17 10	4 11	18 3												
Tu.	8	10 34	10 33	9 1	10 55	9 2	9 52	23 9	10 11	24 2	4 35	18 9	4 58	19 2												
W.	9	11 25	11 16	9 3	11 37	9 4	10 31	24 5	10 51	24 8	5 20	19 6	5 42	19 10												
Th.	10	0a19	11 59	9 5	—	—	11 11	25 0	11 32	25 3	6 3	20 1	6 24	20 4												
F.	11	1 15	0 21	9 6	0 42	9 7	11 53	25 4	—	—	6 45	20 6	7 5	20 6												
S.	12	2 12	1 3	9 7	1 25	9 7	0 14	25 5	0 35	25 5	7 25	20 6	7 46	20 4												
S.	13	3 9	1 46	9 7	2 8	9 7	0 57	25 4	1 18	25 1	8 8	20 2	8 32	20 0												
M.	14	4 5	2 31	9 6	2 54	9 5	1 41	24 9	2 5	24 5	8 56	19 9	9 20	19 5												
Tu.	15	5 0	3 17	9 4	3 43	9 3	2 29	24 0	2 54	23 7	9 45	19 0	10 10	18 7												
W.	16	5 52	4 10	9 2	4 39	9 1	3 21	23 2	3 50	22 8	10 36	18 3	11 3	17 10												
Th.	17	6 43	5 9	9 0	5 39	8 11	4 23	22 4	4 56	22 0	11 28	17 5	11 57	17 7												
F.	18	7 34	6 11	8 10	6 45	8 9	5 32	21 11	6 11	22 0	—	—	0 27	17 3												
S.	19	8 25	7 17	8 9	7 51	8 10	6 45	22 3	7 20	22 8	0 59	17 4	1 38	17 6												
S.	20	9 17	8 24	8 11	8 54	9 1	7 52	23 1	8 21	23 5	2 15	17 10	2 48	18 3												
M.	21	10 10	9 25	9 2	9 55	9 3	8 49	23 10	9 16	24 3	3 21	18 9	3 53	19 2												
Tu.	22	11 4	10 22	9 4	10 48	9 4	9 41	24 7	10 5	24 10	4 23	19 6	4 51	19 10												
W.	23	11 58	11 14	9 5	11 39	9 5	10 29	25 0	10 53	25 1	5 18	20 0	5 44	20 2												
Th.	24	morn.	—	—	0 3	9 5	11 16	25 2	11 38	25 2	6 8	20 3	6 29	20 3												
F.	25	0 52	0 26	9 6	0 48	9 6	12 0	25 1	—	—	6 51	20 3	7 10	20 1												
S.	26	1 44	1 9	9 5	1 29	9 5	0 20	24 11	0 40	24 9	7 29	19 10	7 47	19 7												
S.	27	2 34	1 48	9 4	2 6	9 4	0 59	24 6	1 17	24 1	8 6	19 4	8 26	19 0												
M.	28	3 21	2 25	9 3	2 44	9 2	1 35	23 8	1 54	23 3	8 46	18 8	9 6	18 4												
Tu.	29	4 6	3 4	9 1	3 23	9 0	2 14	22 10	2 34	22 6	9 25	18 0	9 44	17 7												
W.	30	4 49	3 43	8 10	4 3	8 9	2 54	22 0	3 14	21 7	10 3	17 3	10 22	16 11												

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	2	7	21	Morning.
New - - - -	10	3	52	Morning.
First Quarter -	17	2	15	Morning.
Full - - - -	24	1	39	Morning.
<hr/>				
In Apogee - -	2	12	0	Midnight.
In Perigee - -	16	10	0	Morning.
In Apogee - -	30	6	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	12	8.33	9	17	N.43	17	3	N.9	25	20	S.18
2	8	58	10	19	42	18	1	S.49	26	18	58
3	5	3	11	20	35	19	6	40	27	16	45
4	0	55	12	20	16	20	11	8	28	13	50
5	3	N.18	13	18	42	21	14	57	29	10	23
6	7	27	14	16	0	22	17	54	30	6	32
7	11	22	15	12	20	23	19	49			
8	14	52	16	7	57	24	20	37			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	D.								
Tu.	1	11	0	29	9	11	23	29	0	2	27	13	0	2	55	12	9	3	25	9	2	3	53	9	0	20.8
W.	2	11	50	28	6	—	—	—	—	3	24	12	6	3	56	12	4	4	22	8	10	4	54	8	9	21.8
Th.	3	0	22	28	3	0	54	28	2	4	32	12	4	5	7	12	5	5	26	8	8	5	58	8	9	22.8
F.	4	1	26	28	4	1	58	28	8	5	38	12	7	6	7	12	9	6	26	8	10	6	54	9	0	23.8
S.	5	2	29	29	2	3	0	29	10	6	35	13	0	7	1	13	3	7	22	9	2	7	49	9	4	24.8
S.	6	3	31	30	6	4	0	31	2	7	25	13	6	7	48	13	10	8	15	9	6	8	40	9	8	25.8
M.	7	4	25	31	11	4	50	32	9	8	8	14	1	8	27	14	4	9	2	9	10	9	24	9	11	26.8
Tu.	8	5	15	33	6	5	39	34	3	8	47	14	8	9	6	14	11	9	46	10	1	10	6	10	3	27.8
W.	9	6	2	34	9	6	24	35	3	9	25	15	1	9	44	15	3	10	24	10	5	10	42	10	7	28.8
Th.	10	6	46	35	8	7	7	36	0	10	4	15	5	10	23	15	7	11	1	10	8	11	21	10	9	29.8
F.	11	7	28	36	3	7	48	36	5	10	42	15	8	11	1	15	8	11	41	10	9	—	—	—	—	30.8
S.	12	8	9	36	6	8	29	36	5	11	20	15	7	11	42	15	6	0	2	10	10	0	24	10	8	31.8
S.	13	8	50	36	3	9	12	36	0	—	—	—	—	0	6	15	5	0	46	10	7	1	10	10	6	32.8
M.	14	9	34	35	7	9	55	35	0	0	31	15	3	0	58	15	0	1	34	10	4	1	59	10	3	33.8
Tu.	15	10	17	34	5	10	39	33	8	1	25	14	9	1	53	14	6	2	25	10	1	2	53	10	0	34.8
W.	16	11	3	33	0	11	30	32	4	2	23	14	3	2	55	14	0	3	21	9	10	3	53	9	9	35.8
Th.	17	11	58	31	10	—	—	—	—	3	29	13	10	4	4	13	9	4	28	9	7	5	2	9	6	36.8
F.	18	0	31	31	7	1	4	31	6	4	41	13	9	5	18	13	10	5	35	9	5	6	7	9	6	37.8
S.	19	1	37	31	7	2	13	31	11	5	49	14	0	6	20	14	2	6	36	9	7	7	7	9	9	38.8
S.	20	2	48	32	5	3	23	32	10	6	50	14	4	7	17	14	6	7	37	9	11	8	7	10	0	39.8
M.	21	3	58	33	5	4	32	34	1	7	45	14	9	8	12	15	0	8	37	10	2	9	7	10	3	40.8
Tu.	22	5	4	34	9	5	32	35	3	8	37	15	2	9	0	15	4	9	35	10	5	10	0	10	6	41.8
W.	23	5	59	35	7	6	25	35	10	9	23	15	5	9	46	15	6	10	22	10	7	10	44	10	8	42.8
Th.	24	6	49	35	11	7	12	35	11	10	8	15	7	10	28	15	6	11	5	10	9	11	26	10	9	43.8
F.	25	7	34	36	0	7	54	35	9	10	47	15	5	11	5	15	4	11	47	10	8	—	—	—	—	44.8
S.	26	8	13	35	6	8	31	35	2	11	24	15	2	11	44	15	0	0	7	10	7	0	28	10	6	45.8
S.	27	8	48	34	10	9	6	34	5	—	—	—	—	0	4	14	9	0	48	10	4	1	8	10	2	46.8
M.	28	9	24	33	11	9	42	33	4	0	25	14	7	0	47	14	4	1	28	10	0	1	48	9	10	47.8
Tu.	29	10	0	32	9	10	16	32	1	1	9	14	1	1	31	13	10	2	9	9	9	2	31	9	7	48.8
W.	30	10	32	31	5	10	49	30	9	1	53	13	7	2	15	13	4	2	53	9	5	3	15	9	4	49.8
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.	
1	2	28	Add.	9	1	4	Add.	17	0	36	Sub.	25	2	18	Sub.
2	2	19		10	0	52		18	0	49		26	2	31	
3	2	9		11	0	40		19	1	1		27	2	43	
4	1	59		12	0	28		20	1	14		28	2	56	
5	1	49		13	0	15		21	1	27		29	3	8	
6	1	38		14	0	3		22	1	40		30	3	19	
7	1	27		15	0	10	Sub.	23	1	53					
8	1	16		16	0	23		24	2	6					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. ! HOLYHEAD add 18 m. ! KINGSTOWN subtract 1 m. for Dublin Time.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
		H.	M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Tu.	1	5m28	3	9	8	4		3	37	8	2	0	20	5	8	0	55	5	6	10	1	8	4	10	33	8	5
W.	2	6 12	4	5	8	1		4	35	8	0	1	31	5	5	2	8	5	5	11	6	8	2	11	40	8	2
Th.	3	6 54	5	7	8	0		5	38	8	0	2	44	5	6	3	17	5	8	—	—	—	—	0	12	8	2
F.	4	7 36	6	8	8	0		6	38	8	0	3	44	5	10	4	10	6	0	0	42	8	3	1	12	8	5
S.	5	8 18	7	8	8	1		7	35	8	2	4	34	6	2	4	55	6	4	1	41	8	7	2	7	8	10
S.	6	9 1	8	0	8	4		8	22	8	6	5	15	6	6	5	34	6	7	2	32	9	1	2	53	9	3
M.	7	9 47	8	41	8	8		9	1	8	10	5	52	6	9	6	11	6	10	3	12	9	6	3	30	9	9
Tu.	8	10 34	9	22	8	11		9	42	9	1	6	32	7	0	6	53	7	2	3	49	10	0	4	8	10	3
W.	9	11 25	10	1	9	2		10	20	9	3	7	13	7	3	7	34	7	4	4	27	10	6	4	47	10	8
Th.	10	0a19	10	40	9	3		11	0	9	4	7	54	7	5	8	14	7	6	5	8	10	10	5	29	10	11
F.	11	1 15	11	20	9	4		11	39	9	3	8	33	7	6	8	51	7	6	5	49	11	0	6	8	10	11
S.	12	2 12	11	58	9	3		—	—	—	—	9	10	7	5	9	30	7	4	6	28	10	10	6	51	10	9
S.	13	3 9	0	21	9	3		0	45	9	3	9	51	7	2	10	13	7	1	7	14	10	7	7	37	10	4
M.	14	4 5	1	10	9	2		1	36	9	2	10	37	6	11	11	2	6	9	8	1	10	1	8	26	9	10
Tu.	15	5 0	2	4	9	1		2	35	8	11	11	34	6	7	—	—	—	—	8	54	9	8	9	25	9	5
W.	16	5 52	3	5	8	9		3	37	8	8	0	10	6	5	0	51	6	3	10	1	9	3	10	39	9	2
Th.	17	6 43	4	10	8	7		4	42	8	7	1	34	6	2	2	14	6	2	11	14	9	2	11	49	9	1
F.	18	7 34	5	16	8	6		5	49	8	6	2	53	6	3	3	27	6	5	—	—	—	—	0	23	9	3
S.	19	8 25	6	19	8	6		6	51	8	6	3	54	6	8	4	20	6	10	0	53	9	4	1	25	9	5
S.	20	9 17	7	24	8	7		7	52	8	8	4	45	6	11	5	7	7	0	1	56	9	7	2	24	9	9
M.	21	10 10	8	19	8	10		8	46	9	0	5	30	7	1	5	56	7	2	2	50	10	0	3	15	10	2
Tu.	22	11 4	9	11	9	2		9	36	9	3	6	21	7	3	6	46	7	4	3	39	10	5	4	2	10	7
W.	23	11 58	9	59	9	3		10	22	9	4	7	11	7	5	7	36	7	5	4	25	10	9	4	49	10	10
Th.	24	morn.	10	44	9	4		11	5	9	3	7	58	7	6	8	18	7	6	5	12	10	11	5	34	10	11
F.	25	0 52	11	25	9	3		11	44	9	2	8	38	7	5	8	56	7	4	5	55	10	10	6	14	10	9
S.	26	1 44	—	—	—	—		0	3	9	1	9	14	7	2	9	31	7	0	6	33	10	7	6	52	10	4
S.	27	2 34	0	23	9	1		0	44	9	0	9	49	6	10	10	7	6	9	7	12	10	1	7	31	9	10
M.	28	3 21	1	4	8	11		1	26	8	10	10	27	6	7	10	48	6	5	7	51	9	7	8	11	9	5
Tu.	29	4 6	1	49	8	9		2	12	8	8	11	11	6	3	11	36	6	1	8	32	9	2	8	54	8	11
W.	30	4 49	2	35	8	7		2	57	8	5	—	—	—	—	0	3	5	10	9	18	8	9	9	44	8	7
Half Mean Spring } Range.			4ft. 9in.								3ft. 10in.								5ft. 7in.								

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter	2	7	21	Morning.
New	10	3	52	Morning.
First Quarter	17	2	15	Morning.
Full	24	1	39	Morning.
In Apogee	2	12	0	Midnight.
In Perigee	16	10	0	Morning.
In Apogee	30	6	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	12	8.33	9	17	N.43	17	3	N. 9	25	20	3.1
2	8	58	10	19	42	18	1	S.49	26	18	5
3	5	3	11	20	35	19	6	40	27	16	4
4	0	55	12	20	16	20	11	8	28	13	3
5	3	N.18	13	18	42	21	14	57	29	10	2
6	7	27	14	16	0	22	17	54	30	6	3
7	11	22	15	12	20	23	19	49			
8	14	52	16	7	57	24	20	37			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 8 m.

JUNE, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	D.								
Tu.	1	9 16	11 0	9 43	10 9	9 25	9 4	9 48	9 2	9 40	10 4	10 6	10 1	20.8												
W.	2	10 14	10 7	10 48	10 7	10 14	9 0	10 47	8 11	10 37	9 11	11 8	9 10	(
Th.	3	11 22	10 8	11 53	10 9	11 20	8 11	11 52	9 0	11 38	9 9	—	—	22.8												
F.	4	—	—	0 23	11 0	—	—	0 23	9 2	0 7	9 9	0 35	9 10	23.8												
S.	5	0 53	11 3	1 19	11 7	0 54	9 4	1 24	9 6	1 4	10 0	1 33	10 3	24.8												
S.	6	1 43	11 10	2 5	12 2	1 53	9 8	2 19	9 11	2 2	10 5	2 30	10 8	25.8												
M.	7	2 26	12 6	2 46	12 9	2 42	10 1	3 4	10 4	2 55	10 11	3 20	11 1	26.8												
Tu.	8	3 7	13 1	3 28	13 5	3 27	10 7	3 49	10 10	3 45	11 4	4 8	11 7	27.8												
W.	9	3 47	13 7	4 7	13 10	4 10	11 0	4 30	11 2	4 31	11 9	4 53	11 10	28.8												
Th.	10	4 27	14 1	4 47	14 3	4 51	11 4	5 13	11 5	5 14	11 11	5 34	12 0	●												
F.	11	5 8	14 5	5 29	14 5	5 35	11 6	5 56	11 6	5 55	12 2	6 16	12 2	1.3												
S.	12	5 50	14 5	6 12	14 4	6 17	11 6	6 38	11 6	6 37	12 2	6 59	12 2	2.3												
S.	13	6 35	14 2	6 59	14 0	7 0	11 5	7 23	11 3	7 21	12 2	7 44	12 1	3.3												
M.	14	7 24	13 9	7 50	13 6	7 47	11 1	8 11	10 11	8 7	12 0	8 29	11 11	4.3												
Tu.	15	8 18	13 3	8 47	12 10	8 35	10 9	9 1	10 6	8 53	11 9	9 17	11 6	5.3												
W.	16	9 17	12 5	9 49	12 3	9 28	10 4	9 55	10 2	9 42	11 4	10 12	11 2	6.3												
Th.	17	10 22	12 1	10 57	12 1	10 22	10 0	10 56	10 0	10 44	10 11	11 17	10 10	7.3												
F.	18	11 33	12 2	—	—	11 30	9 11	—	—	11 49	10 9	—	—	8.3												
S.	19	0 5	12 3	0 37	12 6	0 3	10 0	0 37	10 2	0 17	10 9	0 48	10 11	9.3												
S.	20	1 8	12 9	1 35	13 0	1 11	10 3	1 44	10 5	1 20	11 0	1 53	11 2	10.3												
M.	21	2 2	13 3	2 30	13 5	2 17	10 7	2 47	10 9	2 28	11 5	3 2	11 7	11.3												
Tu.	22	2 57	13 8	3 22	13 10	3 15	10 11	3 42	11 1	3 33	11 9	4 2	11 10	12.3												
W.	23	3 46	14 0	4 9	14 1	4 8	11 3	4 32	11 4	4 29	12 0	4 55	12 0	13.3												
Th.	24	4 31	14 2	4 52	14 3	4 55	11 5	5 18	11 5	5 19	12 0	5 40	12 0	○												
F.	25	5 13	14 3	5 33	14 1	5 40	11 4	6 0	11 3	6 1	12 0	6 21	12 0	15.3												
S.	26	5 53	13 11	6 13	13 9	6 20	11 2	6 39	11 1	6 41	11 11	7 1	11 10	16.3												
S.	27	6 33	13 6	6 53	13 3	6 59	10 11	7 18	10 9	7 20	11 9	7 38	11 7	17.3												
M.	28	7 13	13 0	7 35	12 9	7 38	10 7	7 58	10 5	7 57	11 6	8 16	11 4	18.3												
Tu.	29	7 56	12 6	8 18	12 2	8 16	10 3	8 34	10 0	8 34	11 2	8 52	11 0	19.3												
W.	30	8 40	11 9	9 2	11 5	8 53	9 10	9 13	9 7	9 10	10 10	9 28	10 8	20.3												
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	2	28	Add.	9	1	4	Add.	17	0	36	Sub.	25	2	18	Sub.
2	2	19		10	0	52		18	0	49		26	2	31	
3	2	9		11	0	40		19	1	1		27	2	43	
4	1	59		12	0	28		20	1	14		28	2	56	
5	1	49		13	0	15		21	1	27		29	3	8	
6	1	38		14	0	3		22	1	40		30	3	19	
7	1	27		15	0	10	Sub.	23	1	53					
8	1	16		16	0	23		24	2	6					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

JULY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.							
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.		
Th.	1	5m31	8	25	14	4	8	48	14	1	9	52	12	0	10	15	12	4	4	0	10	8	4	21	10	6					
F.	2	6 13	9	14	13	10	9	44	13	9	10	40	11	8	11	7	12	0	4	45	10	4	5	10	10	2					
S.	3	6 56	10	15	13	9	10	48	13	10	11	38	11	8	—	—	—	—	5	37	10	1	6	7	10	3					
S.	4	7 39	11	22	14	0	11	54	14	3	0	14	12	1	0	50	12	0	6	38	10	0	7	10	10	2					
M.	5	8 25	—	—	—	—	0	25	14	7	1	26	12	5	2	0	12	7	7	41	10	4	8	13	10	7					
Tu.	6	9 14	0	54	15	0	1	20	15	6	2	33	12	11	3	2	13	3	8	44	10	10	9	11	11	1					
W.	7	10 7	1	45	16	1	2	9	16	8	3	30	13	7	3	56	14	0	9	37	11	4	10	3	11	7					
Th.	8	11 2	2	32	17	2	2	55	17	9	4	22	14	3	4	47	14	9	10	28	11	10	10	51	12	1					
F.	9	12 0	3	17	18	3	3	40	18	7	5	11	14	9	5	34	15	4	11	13	12	3	11	36	12	4					
S.	10	0259	4	3	18	10	4	25	19	1	5	57	15	2	6	19	15	9	11	59	12	6	—	—	—	—					
S.	11	1 57	4	47	19	3	5	9	19	3	6	42	15	4	7	4	16	0	0	22	12	8	0	46	12	8					
M.	12	2 54	5	32	19	2	5	55	19	1	7	25	15	5	7	47	16	0	1	9	12	8	1	32	12	8					
Tu.	13	3 48	6	19	18	11	6	43	18	7	8	10	15	2	8	33	15	5	1	56	12	8	2	20	12	7					
W.	14	4 40	7	8	18	1	7	34	17	7	8	55	14	9	9	19	15	1	2	45	12	5	3	9	12	3					
Th.	15	5 32	8	1	17	1	8	28	16	6	9	43	14	2	10	8	14	4	3	34	12	1	3	59	11	10					
F.	16	6 22	8	56	16	0	9	25	15	8	10	34	13	6	11	2	13	8	4	25	11	7	4	52	11	4					
S.	17	7 13	9	56	15	5	10	31	15	3	11	32	13	1	—	—	—	—	5	20	11	1	5	49	10	11					
S.	18	8 5	11	7	15	2	11	43	15	2	0	6	13	2	0	42	13	0	6	22	10	9	6	56	10	8					
M.	19	8 58	—	—	—	—	0	20	15	4	1	20	13	1	1	57	13	2	7	31	10	9	8	8	10	11					
Tu.	20	9 51	0	54	15	7	1	25	15	11	2	34	13	4	3	6	13	8	8	44	11	1	9	17	11	3					
W.	21	10 44	1	53	16	4	2	18	16	9	3	37	13	10	4	6	14	4	9	47	11	6	10	13	11	8					
Th.	22	11 36	2	43	17	1	3	6	17	5	4	32	14	3	4	57	14	9	10	38	11	9	11	1	11	10					
F.	23	morn.	3	28	17	8	3	49	17	10	5	20	14	6	5	41	15	1	11	24	11	11	11	45	12	0					
S.	24	0 27	4	9	17	11	4	28	17	11	6	1	14	8	6	20	15	3	—	—	—	—	0	5	12	1					
S.	25	1 15	4	46	17	11	5	3	17	10	6	40	14	8	6	57	15	3	0	25	12	0	0	44	12	0					
M.	26	2 1	5	20	17	8	5	37	17	7	7	12	14	5	7	27	15	0	1	2	12	0	1	20	11	11					
Tu.	27	2 45	5	54	17	5	6	11	17	3	7	43	14	2	7	59	14	6	1	38	11	10	1	55	11	12					
W.	28	3 28	6	28	16	11	6	46	16	7	8	15	13	8	8	30	13	11	2	11	11	9	2	29	11	7					
Th.	29	4 9	7	4	16	2	7	23	15	10	8	46	13	2	9	1	13	4	2	47	11	6	3	5	11	4					
F.	30	4 51	7	42	15	4	8	2	14	11	9	17	12	8	9	36	12	9	3	23	11	2	3	41	11	3					
S.	31	5 33	8	25	14	6	8	49	14	1	9	57	12	3	10	19	12	3	4	0	10	9	4	22	10	7					
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.												
Phases of the Moon.																Moon's Declination at Noon.															
D. H. M.																M.D. ° ' "															
Last Quarter 2 0 46 Morning.																1 28.28 9 20N.33 17 10S. 2 25 14S.32															
New - - - - - 9 1 38 Afternoon.																2 1N.43 10 19 24 18 14 0 26 11 34															
First Quarter 16 6 48 Morning.																3 5 53 11 17 0 19 17 9 27 7 33															
Full - - - - - 23 1 54 Afternoon.																4 9 53 12 13 31 20 19 21 28 3 35															
Last - - - - - 31 5 6 Afternoon.																5 13 33 13 9 13 21 20 28 29 0S.9															
																6 16 40 14 4 25 22 20 31 30 4 28															
In Perigee - - 12 5 0 Afternoon.																7 19 2 15 0S.35 23 19 31 31 8 25															
In Apogee - - 28 0 0 Noon.																8 20 23 16 5 30 24 17 35															

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, — for
BREST add 18 m. † DEVONPORT add 17 m. † PORTSMOUTH add 4 m.

JULY, 1869.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	D.
Th.	1	3 41	15 7	4 2	15 3	5 11	13 9	5 34	13 7	6 40	17 6	7 3	17 3	21° 3
F.	2	4 24	15 0	4 47	14 8	5 58	13 4	6 24	13 2	7 27	17 0	7 53	16 10	(
S.	3	5 12	14 6	5 39	14 5	6 53	13 0	7 24	13 0	8 23	16 7	8 55	16 6	23° 3
S.	4	6 7	14 5	6 37	14 8	7 57	13 1	8 29	13 2	9 28	16 7	9 58	16 9	24° 3
M.	5	7 8	14 11	7 40	15 3	9 1	13 5	9 32	13 7	10 28	17 0	10 58	17 3	25° 3
Tu.	6	8 9	15 7	8 35	16 0	10 2	13 10	10 30	14 1	11 28	17 7	11 57	17 11	26° 3
W.	7	9 0	16 5	9 26	16 10	10 55	14 5	11 19	14 8	—	—	0 23	18 3	27° 3
Th.	8	9 52	17 2	10 17	17 7	11 42	14 11	—	—	0 46	18 8	1 11	19 0	28° 3
F.	9	10 41	17 11	11 6	18 2	0 5	15 2	0 28	15 6	1 35	19 4	1 58	19 7	●
S.	10	11 31	18 5	11 55	18 8	0 50	15 8	1 13	15 10	2 19	19 9	2 42	19 11	0° 9
S.	11	—	—	0 19	18 10	1 35	16 0	1 57	16 1	3 5	20 1	3 27	20 3	1° 9
M.	12	0 44	18 11	1 9	18 11	2 18	16 2	2 40	16 2	3 48	20 4	4 10	20 4	2° 9
Tu.	13	1 34	18 10	2 0	18 9	3 2	16 2	3 25	16 0	4 32	20 4	4 57	20 4	3° 9
W.	14	2 25	18 6	2 50	18 3	3 49	15 10	4 13	15 8	5 20	20 2	5 45	19 11	4° 9
Th.	15	3 15	17 10	3 40	17 5	4 37	15 5	5 3	15 1	6 9	19 6	6 36	19 1	5° 9
F.	16	4 6	17 0	4 32	16 7	5 31	14 10	6 0	14 7	7 4	18 9	7 32	18 5	6° 9
S.	17	4 58	16 2	5 24	15 10	6 31	14 4	7 3	14 1	8 1	18 0	8 33	17 9	7° 9
S.	18	5 52	15 7	6 22	15 6	7 37	14 0	8 12	13 11	9 6	17 7	9 39	17 6	8° 9
M.	19	6 56	15 7	7 34	15 10	8 47	14 0	9 22	14 1	10 13	17 8	10 48	17 10	9° 9
Tu.	20	8 10	16 1	8 40	16 4	9 57	14 3	10 30	14 5	11 23	18 0	11 57	18 3	10° 9
W.	21	9 9	16 7	9 37	16 10	10 59	14 8	11 27	14 10	—	—	0 29	18 6	11° 9
Th.	22	10 4	17 1	10 29	17 4	11 52	15 0	—	—	0 57	18 10	1 22	19 1	12° 9
F.	23	10 53	17 6	11 16	17 7	0 16	15 2	0 39	15 3	1 46	19 3	2 9	19 4	○
S.	24	11 38	17 8	11 58	17 8	1 1	15 4	1 22	15 5	2 30	19 5	2 51	19 6	14° 9
S.	25	—	—	0 17	17 8	1 41	15 6	2 0	15 5	3 10	19 6	3 28	19 6	15° 9
M.	26	0 36	17 8	0 55	17 8	2 17	15 5	2 34	15 4	3 46	19 6	4 2	19 5	16° 9
Tu.	27	1 15	17 7	1 34	17 6	2 50	15 3	3 7	15 2	4 20	19 4	4 38	19 4	17° 9
	28	1 51	17 4	2 9	17 2	3 24	15 1	3 41	14 11	4 56	19 3	5 13	19 2	18° 9
Th.	29	2 28	16 11	2 46	16 8	3 58	14 9	4 16	14 7	5 29	18 11	5 46	18 8	19° 9
F.	30	3 4	16 4	3 22	16 1	4 35	14 4	4 53	14 1	6 6	18 3	6 24	18 0	20° 9
S.	31	3 41	15 9	4 3	15 5	5 12	13 11	5 34	13 8	6 43	17 8	7 5	17 4	(
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				10ft. 1½in.				

Half Mean Spring } 9ft. 4in.
Range.

8^{ft.} 0^{in.}

10^{ft.} 1 $\frac{1}{2}$ in.

Equation of Time at Noon.

M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.		M.D.	M.	S.	
1	3	31	Sub.	9	4	54	Sb.	17	5	50	Sub.	25	6	13	Sub.
2	3	42		10	5	3		18	5	55		26	6	13	
3	3	54		11	5	11		19	5	59		27	6	12	
4	4	4		12	5	19		20	6	3		28	6	11	
5	4	15		13	5	26		21	6	6		29	6	10	
6	4	25		14	5	33		22	6	8		30	6	8	
7	4	35		15	5	39		23	6	10		31	6	5	
8	4	45		16	5	45		24	6	12					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER *subtract* 5 m. | SHEERNESS *subtract* 3 m. LONDON 0 m.

D 2

JULY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.		H. M. F. I.	
Th.	1	5m31	4 26 10 0		4 48 9 11		11 13 17 1		11 40 16 10		8 6 11 6		8 30 11 4	
F.	2	6 13	5 11 9 10		5 34 9 9		— —		0 9 16 7		8 56 11 2		9 24 11 1	
S.	3	6 56	6 1 9 8		6 30 9 8		0 38 16 4		1 7 16 3		9 55 11 0		10 26 11 0	
S.	4	7 39	7 4 9 9		7 37 9 10		1 36 16 3		2 5 16 5		10 56 11 0		11 26 11 2	
M.	5	8 25	8 9 9 11		8 39 10 0		2 34 16 8		3 2 17 0		11 54 11 5		— —	
Tu.	6	9 14	9 9 10 2		9 37 10 4		3 30 17 5		3 59 17 11		0 22 11 8		0 49 12 0	
W.	7	10 7	10 3 10 7		10 28 10 9		4 23 18 4		4 47 18 9		1 14 12 4		1 38 12 7	
Th.	8	11 2	10 52 10 11		11 17 11 1		5 10 19 2		5 33 19 6		2 4 12 11		2 29 13 2	
F.	9	12 0	11 41 11 3		— —		5 57 19 10		6 20 20 2		2 53 13 6		3 15 13 9	
S.	10	0a59	0 4 11 5		0 26 11 6		6 44 20 5		7 7 20 8		3 36 14 0		3 58 14 3	
S.	11	1 57	0 48 11 7		1 10 11 7		7 29 20 10		7 52 21 0		4 20 14 5		4 42 14 6	
M.	12	2 54	1 33 11 7		1 55 11 6		8 14 21 1		8 36 21 0		5 4 14 6		5 26 14 5	
Tu.	13	3 48	2 18 11 6		2 42 11 5		8 59 20 10		9 24 20 7		5 50 14 3		6 16 14 0	
W.	14	4 40	3 7 11 3		3 31 11 2		9 50 20 3		10 14 19 11		6 41 13 9		7 7 13 6	
Th.	15	5 32	3 55 11 0		4 20 10 11		10 40 19 6		11 8 19 1		7 35 13 3		8 3 13 0	
F.	16	6 22	4 46 10 9		5 13 10 7		11 40 18 9		— —		8 32 12 8		9 3 12 5	
S.	17	7 13	5 42 10 5		6 12 10 4		0 15 18 3		0 48 17 11		9 34 12 2		10 7 13 0	
S.	18	8 5	6 44 10 3		7 20 10 3		1 19 17 9		1 49 17 7		10 41 11 11		11 13 11 10	
M.	19	8 58	7 55 10 3		8 29 10 4		2 20 17 7		2 52 17 9		11 45 11 11		— —	
Tu.	20	9 51	9 3 10 5		9 37 10 7		3 25 18 1		3 59 18 5		0 17 12 2		0 49 12 4	
W.	21	10 44	10 8 10 9		10 38 10 10		4 28 18 8		4 56 19 0		1 19 12 7		1 48 12 9	
Th.	22	11 36	11 3 10 11		11 28 11 1		5 20 19 3		5 44 19 5		2 15 12 11		2 41 13 1	
F.	23	morn.	11 52 11 2		— —		6 7 19 6		6 31 19 7		3 4 13 3		3 25 13 4	
S.	24	0 27	0 14 11 2		0 35 11 2		6 53 19 9		7 13 19 10		3 45 13 6		4 4 13 7	
S.	25	1 15	0 54 11 2		1 13 11 1		7 32 19 10		7 51 19 10		4 22 13 8		4 39 13 8	
M.	26	2 1	1 31 11 2		1 48 11 0		8 7 19 9		8 23 19 8		4 56 13 7		5 13 13 6	
Tu.	27	2 45	2 5 10 11		2 23 10 10		8 40 19 7		8 58 19 4		5 31 13 4		5 49 13 2	
W.	28	3 28	2 41 10 9		2 58 10 8		9 16 19 2		9 34 18 10		6 7 13 0		6 26 12 9	
Th.	29	4 9	3 16 10 7		3 34 10 5		9 52 18 6		10 10 18 3		6 45 12 6		7 5 12 4	
F.	30	4 51	3 52 10 4		4 9 10 3		10 29 17 11		10 49 17 7		7 25 12 2		7 45 11 1	
S.	31	5 33	4 27 10 1		4 47 10 0		11 13 17 3		11 40 16 11		8 6 11 8		8 30 11 5	

Half Mean Spring } 5ft. 9in.
Range.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Last Quarter	2	0	46	Morning.	1	28	28		9	20	N.33		17	10	8.	2	25	14	8.
New - - - -	9	1	38	Afternoon.	2	1	N.43		10	19	24		18	14	0		26	11	
First Quarter	16	6	48	Morning.	3	5	53		11	17	0		19	17	9		27	7	
Full - - - -	23	1	54	Afternoon.	4	9	53		12	13	31		20	19	21		28	3	
Last Quarter	31	5	6	Afternoon.	5	13	33		13	9	13		21	20	28		29	0	
					6	16	40		14	4	25		22	20	31		30	4	
In Perigee -	12	5	0	Afternoon.	7	19	2		15	0	S.35		23	19	31		31	8	
In Apogee -	28	0	0	Noon.	8	20	23		16	5	30		24	17	35				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

JULY, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
Th.	1	8	11	10	4	8	37	10	1	7	6	13	2	7	32	12	11	0	58	10	0	1	22	9	10	21.3
F.	2	9	5	10	0	9	35	9	11	7	59	12	9	8	28	12	7	1	49	9	8	2	19	9	6	☾
S.	3	10	8	9	11	10	39	9	11	9	0	12	6	9	32	12	7	2	52	9	6	3	27	9	6	23.3
S.	4	11	9	10	0	11	40	10	2	10	3	12	8	10	33	12	10	4	1	9	6	4	33	9	7	24.3
M.	5	—	—	—	—	0	9	10	5	11	1	13	0	11	29	13	3	5	3	9	8	5	31	9	10	25.3
Tu.	6	0	36	10	8	1	1	10	10	11	55	13	6	—	—	—	—	5	57	10	2	6	20	10	7	26.3
W.	7	1	24	11	1	1	47	11	5	0	18	13	10	0	41	14	3	6	41	11	0	7	1	11	6	27.3
Th.	8	2	9	11	9	2	32	12	0	1	4	14	7	1	28	15	0	7	21	11	11	7	41	12	4	28.3
F.	9	2	54	12	4	3	15	12	8	1	51	15	5	2	13	15	9	8	2	12	9	8	23	13	0	●
S.	10	3	36	12	11	3	58	13	1	2	35	16	0	2	56	16	2	8	44	13	2	9	5	13	3	0.9
S.	11	4	21	13	3	4	44	13	3	3	17	16	4	3	39	16	4	9	27	13	4	9	50	13	3	1.9
M.	12	5	7	13	2	5	30	13	1	4	1	16	3	4	25	16	2	10	14	13	2	10	39	13	0	2.9
Tu.	13	5	54	13	0	6	19	12	11	4	49	16	1	5	14	15	11	11	5	12	9	11	32	12	6	3.9
W.	14	6	45	12	9	7	10	12	6	5	40	15	8	6	6	15	5	11	58	12	3	—	—	—	—	4.9
Th.	15	7	37	12	3	8	7	11	11	6	34	15	1	7	2	14	9	0	25	11	11	0	54	11	7	5.9
F.	16	8	38	11	6	9	11	11	2	7	32	14	5	8	5	14	1	1	24	11	4	1	56	11	0	☽
S.	17	9	45	11	0	10	20	10	11	8	38	13	11	9	13	13	8	2	29	10	9	3	5	10	7	7.9
S.	18	10	53	10	10	11	25	10	11	9	47	13	7	10	19	13	7	3	43	10	5	4	18	10	4	8.9
M.	19	11	58	11	0	—	—	—	—	10	51	13	8	11	24	13	9	4	52	10	4	5	25	10	4	9.9
Tu.	20	0	31	11	1	1	1	11	3	11	56	13	11	—	—	—	—	5	57	10	7	6	25	10	11	10.9
W.	21	1	29	11	4	1	55	11	6	0	23	14	2	0	49	14	5	6	49	11	3	7	11	11	7	11.9
Th.	22	2	19	11	9	2	42	12	0	1	14	14	8	1	39	14	11	7	32	11	10	7	52	12	2	12.9
F.	23	3	4	12	2	3	25	12	3	2	1	15	2	2	23	15	4	8	12	12	4	8	31	12	5	○
S.	24	3	45	12	5	4	4	12	6	2	44	15	6	3	2	15	6	8	50	12	6	9	8	12	5	14.9
S.	25	4	23	12	6	4	42	12	5	3	19	15	6	3	37	15	5	9	26	12	4	9	43	12	3	15.9
M.	26	4	59	12	4	5	17	12	2	3	54	15	3	4	12	15	2	10	1	12	2	10	20	12	0	16.9
Tu.	27	5	35	12	1	5	53	11	11	4	30	15	2	4	48	14	11	10	38	11	10	10	56	11	8	17.9
W.	28	6	11	11	10	6	29	11	8	5	5	14	9	5	24	14	7	11	15	11	5	11	35	11	2	18.9
Th.	29	6	48	11	6	7	7	11	3	5	43	14	4	6	3	14	1	11	55	10	11	—	—	—	—	19.9
F.	30	7	26	11	1	7	47	10	10	6	23	13	10	6	43	13	7	0	15	10	8	0	35	10	5	20.9
S.	31	8	11	10	6	8	37	10	3	7	5	13	3	7	31	13	0	0	57	10	2	1	23	9	11	☾
Half Mean Spring Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	31	Sub.	9	4	54	Sub.	17	5	50	Sub.	25	6	13	Sub.
2	3	42		10	5	3		18	5	55		26	6	13	
3	3	54		11	5	11		19	5	59		27	6	12	
4	4	4		12	5	19		20	6	3		28	6	11	
5	4	15		13	5	26		21	6	6		29	6	10	
6	4	25		14	5	33		22	6	8		30	6	8	
7	4	35		15	5	39		23	6	10		31	6	5	
8	4	45		16	5	45		24	6	12					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

TIDE TABLES FOR THE

JULY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Th.	1	5m31	4 24	8 8	4 46	8 7	3 35	21 2	3 58	20 9	10 41	16 6	11 16	16 1
F.	2	6 13	5 9	8 6	5 35	8 5	4 24	20 5	4 52	20 1	11 23	15 9	11 48	15 7
S.	3	6 56	6 3	8 4	6 33	8 3	5 24	20 0	5 57	20 0	—	—	0 16	15 6
S.	4	7 39	7 4	8 2	7 36	8 3	6 32	20 2	7 6	20 6	0 45	15 6	1 20	15 8
M.	5	8 25	8 7	8 4	8 37	8 6	7 36	20 10	8 6	21 4	1 55	15 11	2 29	16 4
Tu.	6	9 14	9 6	8 8	9 33	8 9	8 33	21 10	8 57	22 4	3 0	16 10	3 28	17 3
W.	7	10 7	9 58	8 11	10 23	9 0	9 20	22 11	9 43	23 6	3 56	18 0	4 23	18 6
Th.	8	11 2	10 49	9 1	11 14	9 3	10 6	24 0	10 29	24 6	4 51	19 0	5 18	19 7
F.	9	12 0	11 38	9 4	—	—	10 52	24 11	11 15	25 3	5 43	20 0	6 7	20 4
S.	10	0a59	0 3	9 6	0 27	9 7	11 38	25 8	—	—	6 30	20 9	6 52	21 3
S.	11	1 57	0 50	9 9	1 13	9 9	0 1	26 0	0 24	26 2	7 14	21 2	7 36	21 2
M.	12	2 54	1 36	9 10	1 58	9 10	0 47	26 3	1 9	26 2	7 58	21 1	8 22	21 3
Tu.	13	3 48	2 21	9 10	2 46	9 9	1 32	26 0	1 55	25 8	8 47	20 10	9 11	20 6
W.	14	4 40	3 9	9 8	3 32	9 7	2 19	25 3	2 43	24 10	9 34	20 1	9 57	19 9
Th.	15	5 32	3 57	9 6	4 23	9 5	3 8	24 4	3 34	23 10	10 21	19 2	10 46	18 8
F.	16	6 22	4 49	9 3	5 16	9 1	4 1	23 3	4 31	22 8	11 10	18 1	11 34	17 7
S.	17	7 13	5 45	8 11	6 15	8 10	5 3	22 2	5 37	21 11	12 0	17 3	—	—
S.	18	8 5	6 48	8 8	7 21	8 7	6 13	21 9	6 51	21 9	0 29	17 0	1 4	16 13
M.	19	8 58	7 55	8 7	8 32	8 8	7 26	21 11	8 0	22 2	1 43	16 11	2 23	17 3
Tu.	20	9 51	9 7	8 10	9 38	8 11	8 33	22 6	9 2	22 10	3 1	17 5	3 34	17 13
W.	21	10 44	10 8	9 0	10 34	9 0	9 29	23 3	9 54	23 7	4 5	18 3	4 35	18 7
Th.	22	11 36	11 0	9 1	11 25	9 1	10 17	23 11	10 40	24 1	5 3	18 11	5 29	19 3
F.	23	morn.	11 49	9 2	—	—	11 3	24 3	11 24	24 5	5 54	19 5	6 16	19 7
S.	24	0 27	0 12	9 3	0 33	9 4	11 44	24 7	—	—	6 36	19 9	6 55	19 10
S.	25	1 15	0 52	9 4	1 11	9 4	0 4	24 7	0 22	24 8	7 12	19 10	7 29	19 9
M.	26	2 1	1 29	9 5	1 46	9 4	0 39	24 7	0 56	24 6	7 46	19 7	8 4	19 5
Tu.	27	2 45	2 3	9 4	2 20	9 4	1 13	24 4	1 31	24 1	8 22	19 3	8 39	19 1
W.	28	3 28	2 37	9 3	2 54	9 2	1 47	23 9	2 4	23 5	8 56	18 10	9 14	18 6
Th.	29	4 9	3 11	9 1	3 28	9 0	2 22	23 0	2 40	22 8	9 31	18 2	9 47	17 12
F.	30	4 51	3 46	8 11	4 4	8 10	2 57	22 3	3 15	21 10	10 3	17 5	10 22	17 5
S.	31	5 33	4 24	8 9	4 46	8 8	3 35	21 4	3 59	20 11	10 43	16 8	11 3	16 2

Half Mean Spring }
Range.

4ft. 10in.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	2	0	46	Morning.
New - - - - -	9	1	38	Afternoon.
First Quarter -	16	6	48	Morning.
Full - - - - -	23	1	54	Afternoon.
Last Quarter -	31	5	6	Afternoon.
In Perigee - -	12	5	0	Afternoon.
In Apogee - -	28	0	0	Noon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	28	28	9	20	N.33	17	10	S. 2	25	14	S.52
2	1	N.43	10	19	24	18	14	0	26	11	34
3	5	53	11	17	0	19	17	9	27	7	53
4	9	53	12	13	31	20	19	21	28	3	53
5	13	33	13	9	13	21	20	28	29	0	N.19
6	16	40	14	4	25	22	20	31	30	4	13
7	19	2	15	0	S.35	23	19	31	31	8	39
8	20	23	16	5	30	24	17	35			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — for
 GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

JULY, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
Th.	1	11 8 30 2	11 30 29 7	2 38 13 1	3 3 12 11	3 37 9 3	4 2 9 1	21.3						
F.	2	11 55 29 1	— —	3 31 12 9	4 0 12 7	4 29 9 0	4 58 8 10	(
S.	3	0 23 28 10	0 52 28 8	4 33 12 7	5 5 12 8	5 27 8 10	5 56 8 10	23.3						
S.	4	1 23 28 8	1 56 29 0	5 36 12 9	6 6 12 11	6 25 8 11	6 54 9 0	24.3						
M.	5	2 28 29 4	3 1 29 11	6 35 13 1	7 3 13 3	7 22 9 2	7 50 9 4	25.3						
Tu.	6	3 34 30 6	4 5 31 4	7 29 13 6	7 54 13 10	8 18 9 6	8 45 9 8	26.3						
W.	7	4 35 32 2	5 4 33 1	8 17 14 2	8 39 14 6	9 11 9 10	9 37 10 0	27.3						
Th.	8	5 32 34 0	5 59 34 10	9 1 14 10	9 24 15 1	10 1 10 3	10 22 10 5	28.3						
F.	9	6 24 35 6	6 49 36 0	9 46 15 5	10 8 15 7	10 43 10 7	11 5 10 9	●						
S.	10	7 13 36 8	7 36 37 3	10 29 15 10	10 49 16 0	11 27 10 11	11 48 11 0	0.9						
S.	11	7 58 37 6	8 20 37 8	11 9 16 1	11 31 16 1	— —	0 11 11 0	1.9						
M.	12	8 41 37 8	9 3 37 7	11 55 16 0	— —	0 34 11 0	0 58 10 11	2.9						
Tu.	13	9 26 37 4	9 48 36 10	0 20 15 11	0 47 15 9	1 23 10 10	1 49 10 8	3.9						
W.	14	10 9 36 2	10 29 35 5	1 13 15 6	1 39 15 3	2 14 10 6	2 40 10 4	4.9						
Th.	15	10 50 34 7	11 13 33 9	2 6 15 0	2 35 14 8	3 7 10 3	3 34 10 1	5.9						
F.	16	11 38 32 9	— —	3 5 14 4	3 37 14 1	4 3 9 11	4 36 9 8)						
S.	17	0 5 32 0	0 35 31 5	4 10 13 10	4 46 13 8	5 8 9 6	5 39 9 5	7.9						
S.	18	1 7 31 0	1 42 30 10	5 21 13 8	5 53 13 8	6 10 9 5	6 41 9 5	8.9						
M.	19	2 18 30 10	2 55 31 1	6 25 13 9	6 57 13 10	7 12 9 6	7 45 9 7	9.9						
Tu.	20	3 35 31 6	4 11 32 0	7 28 14 0	7 58 14 2	8 18 9 9	8 50 9 10	10.9						
W.	21	4 45 32 8	5 16 33 3	8 25 14 4	8 49 14 7	9 21 9 11	9 47 10 1	11.9						
Th.	22	5 45 33 10	6 11 34 3	9 12 14 9	9 34 14 11	10 11 10 2	10 32 10 3	12.9						
F.	23	6 36 34 7	6 58 34 10	9 56 15 0	10 17 15 1	10 54 10 5	11 14 10 6	○						
S.	24	7 19 35 1	7 38 35 3	10 35 15 2	10 51 15 2	11 33 10 6	11 51 10 6	14.9						
S.	25	7 56 35 4	8 13 35 3	11 8 15 2	11 24 15 1	— —	0 9 10 6	15.9						
M.	26	8 29 35 1	8 45 35 0	11 42 15 0	— —	0 27 10 5	0 45 10 4	16.9						
Tu.	27	9 2 34 10	9 17 34 7	0 1 14 11	0 20 14 9	1 4 10 3	1 22 10 2	17.9						
W.	28	9 33 34 2	9 49 33 7	0 38 14 7	0 57 14 5	1 40 10 0	1 58 9 11	18.9						
Th.	29	10 4 33 0	10 18 32 6	1 17 14 2	1 37 13 11	2 17 9 9	2 37 9 8	19.9						
F.	30	10 33 31 10	10 49 31 1	1 56 13 9	2 16 13 6	2 56 9 6	3 16 9 5	20.9						
S.	31	11 9 30 5	11 31 29 9	2 38 13 3	3 3 13 0	3 37 9 3	4 2 9 2	(
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 31	Sub.	9	4 54	Sub.	17	5 50	Sub.	25	6 13	Sub.
2	3 42		10	5 3		18	5 55		26	6 13	
3	3 54		11	5 11		19	5 59		27	6 12	
4	4 4		12	5 19		20	6 3		28	6 11	
5	4 15		13	5 26		21	6 6		29	6 10	
6	4 25		14	5 33		22	6 8		30	6 8	
7	4 35		15	5 39		23	6 10		31	6 5	
8	4 45		16	5 45		24	6 12				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JULY, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.				
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Th.	1	5m31	3	20	8	4	3	45	8	3	0	33	5	8	1	4	5	7	10	11	8	6	10	40	8	5
F.	2	6 13	4	11	8	2	4	39	8	2	1	36	5	7	2	12	5	6	11	10	8	4	11	41	8	4
S.	3	6 56	5	8	8	1	5	38	8	1	2	45	5	7	3	15	5	9	—	—	—	—	0	11	8	4
S.	4	7 39	6	7	8	1	6	37	8	1	3	43	5	11	4	10	6	1	0	40	8	5	1	11	8	6
M.	5	8 25	7	7	8	1	7	37	8	2	4	34	6	3	4	57	6	4	1	40	8	7	2	9	8	10
Tu.	6	9 14	8	4	8	4	8	27	8	6	5	19	6	6	5	40	6	7	2	36	9	1	2	59	9	4
W.	7	10 7	8	50	8	8	9	13	8	10	6	1	6	9	6	24	6	11	3	21	9	7	3	42	9	11
Th.	8	11 2	9	37	9	0	10	0	9	2	6	48	7	1	7	12	7	3	4	3	10	2	4	26	10	6
F.	9	12 0	10	22	9	3	10	44	9	4	7	35	7	4	7	57	7	6	4	49	10	9	5	12	10	11
S.	10	0a59	11	6	9	5	11	27	9	5	8	19	7	8	8	40	7	9	5	35	11	2	5	57	11	3
S.	11	1 57	11	48	9	6	—	—	—	—	9	0	7	9	9	21	7	8	6	18	11	3	6	40	11	3
M.	12	2 54	0	10	9	6	0	34	9	5	9	42	7	7	10	4	7	6	7	3	11	1	7	27	10	11
Tu.	13	3 48	0	59	9	5	1	25	9	5	10	28	7	4	10	53	7	3	7	52	10	8	8	16	10	5
W.	14	4 40	1	53	9	4	2	21	9	2	11	19	7	1	11	51	6	10	8	41	10	3	9	8	10	0
Th.	15	5 32	2	49	9	1	3	18	8	11	—	—	—	—	0	25	6	7	9	39	9	9	10	11	9	6
F.	16	6 22	3	48	8	10	4	18	8	8	1	2	6	4	1	41	6	3	10	46	9	4	11	20	9	5
S.	17	7 13	4	49	8	7	5	20	8	6	2	21	6	2	2	57	6	3	11	53	9	2	—	—	—	—
S.	18	8 5	5	51	8	5	6	23	8	4	3	29	6	4	3	58	6	6	0	25	9	1	0	57	9	1
M.	19	8 58	6	57	8	4	7	32	8	4	4	26	6	7	4	53	6	8	1	30	9	1	2	4	9	2
Tu.	20	9 51	8	4	8	5	8	32	8	7	5	19	6	9	5	44	6	9	2	36	9	4	3	3	9	6
W.	21	10 44	8	59	8	9	9	24	8	11	6	9	6	10	6	34	6	11	3	29	9	9	3	51	10	0
Th.	22	11 36	9	48	9	0	10	10	9	1	7	0	7	0	7	23	7	1	4	14	10	2	4	36	10	4
F.	23	morn.	10	32	9	1	10	53	9	2	7	46	7	2	8	7	7	3	4	59	10	5	5	21	10	7
S.	24	0 27	11	12	9	2	11	29	9	2	8	25	7	3	8	42	7	3	5	41	10	8	5	59	10	8
S.	25	1 15	11	46	9	1	—	—	—	—	8	58	7	3	9	14	7	2	6	16	10	7	6	33	10	6
M.	26	2 1	0	3	9	1	0	21	9	1	9	30	7	0	9	46	6	11	6	51	10	4	7	9	10	3
Tu.	27	2 45	0	40	9	1	0	58	9	0	10	3	6	10	10	19	6	9	7	26	10	1	7	43	9	10
W.	28	3 28	1	16	9	0	1	35	8	11	10	36	6	7	10	55	6	6	8	0	9	8	8	18	9	5
Th.	29	4 9	1	56	8	10	2	17	8	9	11	16	6	4	11	39	6	2	8	37	9	3	8	57	9	1
F.	30	4 51	2	38	8	7	2	58	8	6	—	—	—	—	0	4	5	11	9	19	8	11	9	44	8	8
S.	31	5 33	3	20	8	5	3	45	8	4	0	33	5	9	1	4	5	8	10	11	8	6	10	40	8	5

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Last Quarter -	2	0	46	Morning.
New - - - - -	9	1	38	Afternoon.
First Quarter	16	6	48	Morning.
Full - - - - -	23	1	54	Afternoon.
Last Quarter	31	5	6	Afternoon.
In Perigee - -	12	5	0	Afternoon.
In Apogee - -	28	0	0	Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	28	28	9	20	N.33	17	10	S. 2	25	14	S.52
2	1	N.43	10	19	24	18	14	0	26	11	34
3	5	53	11	17	0	19	17	9	27	7	50
4	9	53	12	13	31	20	19	21	28	3	50
5	13	33	13	9	13	21	20	28	29	0	N.19
6	16	40	14	4	25	22	20	31	30	4	28
7	19	2	15	0	S.35	23	19	31	31	8	19
8	20	23	16	5	30	24	17	35			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.		D.
S.	1	4 25 15 0		4 49 14 8		5 59 13 5		6 25 13 3		7 27 17 1		7 52 16 10		22.9
M.	2	5 15 14 5		5 43 14 4		6 54 13 1		7 26 13 0		8 21 16 7		8 56 16 6		23.9
Tu.	3	6 15 14 3		6 49 14 6		8 3 13 0		8 38 13 1		9 32 16 6		10 6 16 8		24.9
W.	4	7 25 14 11		8 0 15 5		9 14 13 4		9 49 13 8		10 41 16 11		11 16 17 3		25.9
Th.	5	8 32 15 11		9 1 16 5		10 22 14 0		10 52 14 4		11 50 17 8		—		26.9
F.	6	9 29 17 0		9 56 17 7		11 20 14 9		11 45 15 1		0 20 18 2		0 48 18 8		27.9
S.	7	10 22 18 1		10 48 18 7		—		0 9 15 6		1 15 19 2		1 42 19 7		●
S.	8	11 14 19 0		11 40 19 4		0 33 15 10		0 57 16 2		2 6 20 0		2 27 20 3		0.6
M.	9	—		0 4 19 7		1 20 16 5		1 43 16 8		2 50 20 6		3 12 20 9		1.6
Tu.	10	0 28 19 9		0 52 19 10		2 5 16 9		2 26 16 10		3 35 20 11		3 55 21 0		2.6
W.	11	1 17 19 9		1 41 19 8		2 48 16 10		3 9 16 9		4 18 21 1		4 42 21 0		3.6
Th.	12	2 5 19 5		2 29 19 0		3 31 16 7		3 54 16 4		5 3 20 11		5 26 20 8		4.6
F.	13	2 53 18 6		3 16 17 11		4 17 16 0		4 41 15 7		5 51 20 4		6 14 19 9		5.6
S.	14	3 40 17 5		4 5 16 9		5 5 15 2		5 31 14 9		6 37 19 2		7 2 18 8		6.6
S.	15	4 30 16 1		4 56 15 6		6 0 14 4		6 30 14 0		7 29 18 2		7 59 17 8		7.6
M.	16	5 26 15 0		6 0 14 9		7 4 13 7		7 41 13 5		8 33 17 3		9 10 17 0		8.6
Tu.	17	6 36 14 8		7 15 14 10		8 21 13 4		9 1 13 5		9 47 16 11		10 27 17 1		9.6
W.	18	7 54 15 2		8 29 15 6		9 39 13 7		10 16 13 10		11 6 17 3		11 43 17 6		10.6
Th.	19	8 58 15 10		9 26 16 3		10 48 14 1		11 17 14 4		—		0 16 17 10		11.6
F.	20	9 51 16 7		10 15 16 11		11 42 14 7		—		0 45 18 3		1 12 18 7		12.6
S.	21	10 36 17 3		10 57 17 6		0 4 14 10		0 25 15 0		1 36 18 11		1 56 19 1		13.6
S.	22	11 17 17 9		11 36 17 10		0 45 15 3		1 5 15 5		2 15 19 3		2 35 19 5		14.6
M.	23	11 54 17 11		—		1 23 15 7		1 40 15 8		2 53 19 7		3 8 19 8		15.6
Tu.	24	0 12 18 0		0 29 18 1		1 56 15 8		2 11 15 8		3 25 19 8		3 41 19 9		16.6
W.	25	0 46 18 1		1 2 18 0		2 27 15 8		2 42 15 7		3 56 19 9		4 12 19 9		17.6
Th.	26	1 19 17 11		1 36 17 9		2 55 15 6		3 10 15 5		4 28 19 8		4 43 19 7		18.6
F.	27	1 53 17 7		2 10 17 4		3 26 15 3		3 42 15 1		4 57 19 6		5 13 19 3		19.6
S.	28	2 27 17 0		2 45 16 8		3 58 14 10		4 15 14 7		5 29 19 0		5 45 18 8		20.6
S.	29	3 3 16 3		3 22 15 10		4 33 14 4		4 52 14 0		6 3 18 3		6 22 17 10		21.6
M.	30	3 43 15 5		4 7 14 11		5 13 13 9		5 37 13 5		6 42 17 6		7 5 17 1		22.6
Tu.	31	4 32 14 6		5 0 14 2		6 4 13 2		6 35 12 11		7 31 16 9		8 3 16 5		23.6
Half Mean Spring } Range.		9ft. 4in.				8ft. 0in.				10ft. 1½in.				

Equation of Time at Noon.

D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	1		9	5	14		17	3	49		25	1	51	
2	5	57		10	5	5		18	3	36		26	1	34	
3	5	53		11	4	56		19	3	22		27	1	17	
4	5	48		12	4	46		20	3	8		28	1	0	
5	5	42		13	4	36		21	2	54		29	0	42	
6	5	36		14	4	25		22	2	39		30	0	24	
7	5	29		15	4	13		23	2	23		31	0	6	
8	5	22		16	4	1		24	2	7					

times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 8 m. LONDON 0 m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.																					
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																	
			Time.		Height.			Time.		Height.			Time.		Height.				Time.		Height.				Time.		Height.													
		H. M.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.										
5.	1	6m17	9	15	13	10	9	46	13	8	10	43	12	0	11	10	11	10	4	45	10	4	5	10	10	2	5	10	10	2										
M.	2	7 4	10	21	13	7	10	57	13	8	11	43	11	10	—	—	—	—	5	40	10	0	6	12	9	11	6	12	9	11										
Tu.	3	7 54	11	35	13	10	—	—	—	—	0	21	12	0	0	59	12	2	6	46	9	11	7	23	10	1	7	23	10	1										
W.	4	8 47	0	12	14	2	0	45	14	9	1	39	12	4	2	16	12	9	7	59	10	4	8	35	10	8	8	35	10	8										
Th.	5	9 44	1	17	15	4	1	46	16	1	2	51	13	0	3	25	13	9	9	8	11	0	9	38	11	3	9	38	11	3										
F.	6	10 42	2	11	16	11	2	36	17	8	3	55	13	10	4	24	14	8	10	6	11	9	10	32	12	1	10	32	12	1										
S.	7	11 42	3	0	18	5	3	24	19	1	4	50	14	7	5	16	15	6	10	56	12	4	11	20	12	7	11	20	12	7										
5.	8	0a40	3	47	19	7	4	11	19	11	5	41	15	3	6	5	16	1	11	43	12	11	—	—	—	—	—	—	—	—										
M.	9	1 37	4	34	20	2	4	56	20	4	6	29	15	8	6	53	16	6	0	7	13	1	0	31	13	2	0	31	13	2										
Tu.	10	2 32	5	17	20	5	5	39	20	3	7	15	15	10	7	37	16	6	0	54	13	3	1	17	13	3	1	17	13	3										
W.	11	3 26	6	1	20	1	6	24	19	9	7	59	15	9	8	22	16	1	1	40	13	3	2	2	13	2	2	2	13	2										
Th.	12	4 18	6	47	19	2	7	11	18	6	8	45	15	4	9	5	15	6	2	25	13	0	2	48	12	9	2	48	12	9										
F.	13	5 10	7	36	17	9	8	1	16	11	9	25	14	9	9	47	14	8	3	12	12	6	3	35	12	2	3	35	12	2										
S.	14	6 2	8	27	16	2	8	55	15	5	10	11	13	11	10	35	13	8	3	59	11	10	4	24	11	3	4	24	11	3										
5.	15	6 54	9	25	14	10	10	0	14	5	11	3	13	2	11	32	12	10	4	50	11	0	5	20	10	8	5	20	10	8										
M.	16	7 47	10	40	14	2	11	21	14	1	—	—	—	0	9	12	8	5	53	10	5	6	30	10	3	6	30	10	3											
Tu.	17	8 40	—	—	—	—	0	2	14	2	0	46	12	6	1	25	12	8	7	10	10	2	7	49	10	4	7	49	10	4										
W.	18	9 32	0	39	14	6	1	13	14	10	2	3	12	7	2	41	13	1	8	27	10	6	9	4	10	9	9	4	10	9										
Th.	19	10 22	1	43	15	4	2	9	15	11	3	18	13	1	3	48	13	10	9	35	11	0	10	3	11	3	10	3	11	3										
F.	20	11 11	2	32	16	5	2	53	16	11	4	15	13	7	4	40	14	6	10	27	11	6	10	49	11	9	10	49	11	9										
S.	21	11 57	3	13	17	5	3	32	17	9	5	2	14	1	5	23	14	11	11	9	11	10	11	28	12	2	11	28	12	2										
5.	22	morn.	3	50	18	0	4	7	18	2	5	43	14	5	6	1	15	2	11	46	12	1	—	—	—	—	—	—	—	—										
M.	23	0 42	4	24	18	2	4	40	18	3	6	18	14	7	6	35	15	3	0	3	12	2	0	20	12	2	0	20	12	2										
Tu.	24	1 25	4	55	18	4	5	11	18	3	6	51	14	7	7	5	15	1	0	38	12	3	0	55	12	3	0	55	12	3										
W.	25	2 7	5	26	18	2	5	42	18	0	7	19	14	5	7	33	14	9	1	11	12	2	1	26	12	2	1	26	12	2										
Th.	26	2 48	5	57	17	9	6	12	17	6	7	48	14	1	8	4	14	3	1	42	12	1	1	57	12	2	1	57	12	2										
F.	27	3 30	6	28	17	1	6	44	16	8	8	19	13	8	8	32	13	9	2	13	11	10	2	29	11	8	2	29	11	8										
S.	28	4 13	7	2	16	2	7	21	15	7	8	46	13	3	9	1	13	1	2	46	11	6	3	3	11	4	3	3	11	4										
5.	29	4 58	7	42	15	1	8	4	14	6	9	20	12	9	9	40	12	6	3	21	11	1	3	41	10	10	3	41	10	10										
M.	30	5 45	8	30	13	11	8	57	13	7	10	1	12	3	10	27	12	0	4	2	10	7	4	27	10	4	4	27	10	4										
Tu.	31	6 35	9	31	13	4	10	10	13	3	10	57	12	0	11	30	11	9	4	54	10	1	5	25	9	11	5	25	9	11										
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																					
Phases of the Moon.												Moon's Declination at Noon.																												
D. H. M.												M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'								
New - - - - - 7 10 8 Afternoon.												1	12	N.14	9	10	N.49	17	20	8.18	25	08.50	1	12	N.14	9	10	N.49	17	20	8.18									
First Quarter- 14 0 41 Afternoon.												2	15	32	10	6	0	18	20	36	26	38.20	2	15	32	10	6	0	18	20	36									
Full - - - - - 22 4 24 Morning.												3	18	11	11	0	52	19	19	52	27	7 33	3	18	11	11	0	52	19	19	52									
Last Quarter - 30 7 58 Morning.												4	19	57	12	4	8.14	20	18	11	28	11 12	4	19	57	12	4	8.14	20	18	11									
												5	20	37	13	8	59	21	15	41	29	14 36	5	20	37	13	8	59	21	15	41									
In Perigee - - 9 1 0 Afternoon.												6	20	1	14	13	9	22	12	33	30	17 26	6	20	1	14	13	9	22	12	33									
In Apogee - - 25 2 0 Morning.												7	18	6	15	16	31	23	8	55	31	19 29	7	18	6	15	16	31	23	8	55									
												8	14	57	16	18	56	24	4	57			8	14	57	16	18	56	24	4	57									

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	D.
S.	1	4 25	15 0	4 49	14 8	5 59	13 5	6 25	13 3	7 27	17 1	7 52	16 10	22.9
M.	2	5 15	14 5	5 43	14 4	6 54	13 1	7 26	13 0	8 21	16 7	8 56	16 6	23.9
Tu.	3	6 15	14 3	6 49	14 6	8 3	13 0	8 38	13 1	9 32	16 6	10 6	16 8	24.9
W.	4	7 25	14 11	8 0	15 5	9 14	13 4	9 49	13 8	10 41	16 11	11 16	17 3	25.9
Th.	5	8 32	15 11	9 1	16 5	10 22	14 0	10 52	14 4	11 50	17 8	—	—	26.9
F.	6	9 29	17 0	9 56	17 7	11 20	14 9	11 45	15 1	0 20	18 2	0 48	18 8	27.9
S.	7	10 22	18 1	10 48	18 7	—	—	0 9	15 6	1 15	19 2	1 42	19 7	●
S.	8	11 14	19 0	11 40	19 4	0 33	15 10	0 57	16 2	2 6	20 0	2 27	20 3	0.6
M.	9	—	—	0 4	19 7	1 20	16 5	1 43	16 8	2 50	20 6	3 12	20 9	1.6
Tu.	10	0 28	19 9	0 52	19 10	2 5	16 9	2 26	16 10	3 35	20 11	3 55	21 0	2.6
W.	11	1 17	19 9	1 41	19 8	2 48	16 10	3 9	16 9	4 18	21 1	4 42	21 0	3.6
Th.	12	2 5	19 5	2 29	19 0	3 31	16 7	3 54	16 4	5 3	20 11	5 26	20 8	4.6
F.	13	2 53	18 6	3 16	17 11	4 17	16 0	4 41	15 7	5 51	20 4	6 14	19 9	5.6
S.	14	3 40	17 5	4 5	16 9	5 5	15 2	5 31	14 9	6 37	19 2	7 2	18 8	6
S.	15	4 30	16 1	4 56	15 6	6 0	14 4	6 30	14 0	7 29	18 2	7 59	17 8	7.6
M.	16	5 26	15 0	6 0	14 9	7 4	13 7	7 41	13 5	8 33	17 3	9 10	17 0	8.6
Tu.	17	6 36	14 8	7 15	14 10	8 21	13 4	9 1	13 5	9 47	16 11	10 27	17 1	9.6
W.	18	7 54	15 2	8 29	15 6	9 39	13 7	10 16	13 10	11 6	17 3	11 43	17 6	10.6
Th.	19	8 58	15 10	9 26	16 3	10 48	14 1	11 17	14 4	—	—	0 16	17 10	11.6
F.	20	9 51	16 7	10 15	16 11	11 42	14 7	—	—	0 45	18 3	1 12	18 7	12.6
S.	21	10 36	17 3	10 57	17 6	0 4	14 10	0 25	15 0	1 36	18 11	1 56	19 1	13.6
S.	22	11 17	17 9	11 36	17 10	0 45	15 3	1 5	15 5	2 15	19 3	2 35	19 5	14.6
M.	23	11 54	17 11	—	—	1 23	15 7	1 40	15 8	2 53	19 7	3 8	19 8	15.6
Tu.	24	0 12	18 0	0 29	18 1	1 56	15 8	2 11	15 8	3 25	19 8	3 41	19 9	16.6
W.	25	0 46	18 1	1 2	18 0	2 27	15 8	2 42	15 7	3 56	19 9	4 12	19 9	17.6
Th.	26	1 19	17 11	1 36	17 9	2 55	15 6	3 10	15 5	4 28	19 8	4 43	19 7	18.6
F.	27	1 53	17 7	2 10	17 4	3 26	15 3	3 42	15 1	4 57	19 6	5 13	19 3	19.6
S.	28	2 27	17 0	2 45	16 8	3 58	14 10	4 15	14 7	5 29	19 0	5 45	18 8	20.6
S.	29	3 3	16 3	3 22	15 10	4 33	14 4	4 52	14 0	6 3	18 3	6 22	17 10	21.6
M.	30	3 43	15 5	4 7	14 11	5 13	13 9	5 37	13 5	6 42	17 6	7 5	17 1	22.6
Tu.	31	4 32	14 6	5 0	14 2	6 4	13 2	6 35	12 11	7 31	16 9	8 3	16 5	23.6
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				10ft. 1½ in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	1	Sub.	9	5	14	Sub.	17	3	49	Sub.	25	1	51	Sub.
2	5	57		10	5	5		18	3	36		26	1	34	
3	5	53		11	4	56		19	3	22		27	1	17	
4	5	48		12	4	46		20	3	8		28	1	0	
5	5	42		13	4	36		21	2	54		29	0	42	
6	5	36		14	4	25		22	2	39		30	0	24	
7	5	29		15	4	13		23	2	23		31	0	6	
8	5	22		16	4	1		24	2	7					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 8 m. LONDON 0 m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.						
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
			Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		
S.	1	6m 17	5 10	9 10			5 35	9 9			—	—		0 9	16 8		8 57	11 3		9 26	11 1
M.	2	7 4	6 1	9 8			6 32	9 8		0 39	16 4		1 10	16 3		9 57	10 11		10 31	10 11	
Tu.	3	7 54	7 10	9 8			7 46	9 9		1 41	16 2		2 13	16 3		11 5	10 11		11 38	11 1	
W.	4	8 47	8 22	9 10			8 56	10 0		2 45	16 7		3 18	17 1		—	—		0 10	11 5	
Th.	5	9 44	9 29	10 3			10 0	10 6		3 50	17 8		4 20	18 3		0 41	11 10		1 10	12 3	
F.	6	10 42	10 30	10 9			10 56	11 0		4 49	18 10		5 13	19 4		1 39	12 8		2 7	13 1	
S.	7	11 42	11 21	11 3			11 46	11 6		5 37	19 11		6 2	20 5		2 33	13 6		2 58	13 10	
S.	8	0a 40	—	—			0 10	11 8		6 26	20 10		6 50	21 3		3 20	14 3		3 42	14 7	
M.	9	1 37	0 33	11 10			0 56	11 11		7 14	21 7		7 38	21 10		4 5	14 11		4 28	15 2	
Tu.	10	2 32	1 19	12 0			1 41	12 0		8 0	21 11		8 21	22 0		4 50	15 3		5 11	15 2	
W.	11	3 26	2 3	11 11			2 26	11 10		8 43	21 11		9 6	21 8		5 34	14 0		5 57	14 9	
Th.	12	4 18	2 49	11 9			3 12	11 7		9 30	21 3		9 53	20 10		6 21	14 6		6 46	14 2	
F.	13	5 10	3 35	11 5			3 58	11 2		10 17	20 3		10 42	19 7		7 11	13 9		7 37	13 4	
S.	14	6 2	4 21	10 11			4 46	10 9		11 9	19 0		11 41	18 5		8 4	12 11		8 32	12 6	
S.	15	6 54	5 13	10 6			5 40	10 3		—	—		0 14	17 9		9 1	12 0		9 35	11 8	
M.	16	7 47	6 11	10 1			6 48	9 11		0 48	17 3		1 22	16 10		10 12	11 5		10 49	11 5	
Tu.	17	8 40	7 29	9 11			8 9	9 11		1 57	16 8		2 33	16 9		11 26	11 3		—	—	
W.	18	9 32	8 47	10 0			9 23	10 2		3 9	17 0		3 44	17 5		0 1	11 4		0 35	11 7	
Th.	19	10 22	9 56	10 4			10 27	10 6		4 17	17 9		4 46	18 2		1 7	11 11		1 36	12 2	
F.	20	11 11	10 53	10 8			11 16	10 10		5 11	18 8		5 33	18 11		2 4	12 6		2 28	12 9	
S.	21	11 57	11 38	11 0			11 58	11 1		5 54	19 2		6 14	19 5		2 51	13 0		3 10	13 3	
S.	22	morn.	—	—			0 18	11 2		6 34	19 8		6 54	19 11		3 28	13 6		3 46	13 8	
M.	23	0 42	0 36	11 3			0 52	11 3		7 11	20 0		7 28	20 1		4 2	13 9		4 18	13 12	
Tu.	24	1 25	1 9	11 3			1 26	11 3		7 45	20 2		8 0	20 2		4 34	13 11		4 50	13 12	
W.	25	2 7	1 42	11 2			1 57	11 2		8 15	20 2		8 30	20 1		5 5	13 10		5 19	13 9	
Th.	26	2 48	2 11	11 1			2 27	11 0		8 45	19 11		9 1	19 8		5 35	13 6		5 52	13 4	
F.	27	3 30	2 44	10 11			3 0	10 9		9 18	19 4		9 34	19 0		6 9	13 1		6 24	12 12	
S.	28	4 13	3 16	10 8			3 32	10 6		9 51	18 8		10 8	18 3		6 44	12 7		7 4	12 4	
S.	29	4 58	3 49	10 4			4 7	10 2		10 27	17 10		10 50	17 4		7 24	12 0		7 45	11 9	
M.	30	5 45	4 27	10 0			4 49	9 10		11 17	16 11		11 48	16 6		8 8	11 5		8 36	11 2	
Tu.	31	6 35	5 15	9 8			5 43	9 7		—	—		0 21	16 2		9 6	10 11		9 42	10 9	
Half Mean Spring } Range.			5ft. 9in.						10ft. 5in.						7ft. 2in.						

<i>Phases of the Moon.</i>				<i>Moon's Declination at Noon.</i>											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	7	10	8	1	12	N. 14	9	10	N. 49	17	20	S. 18	25	08	S. 50
First Quarter -	14	0	41	2	15	32	10	6	0	18	20	36	26	3	N. 20
Full - - - - -	22	4	24	3	18	11	11	0	52	19	19	52	27	7	23
Last Quarter -	30	7	58	4	19	57	12	4	S. 14	20	18	11	28	11	12
				5	20	37	13	8	59	21	15	41	29	14	3
In Perigee - -	9	1	0	6	20	1	14	13	9	22	12	33	30	17	24
In Apogee - -	25	2	0	7	18	6	15	16	31	23	8	55	31	19	20
				8	14	57	16	18	56	24	4	57			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH *subtract 5 m.* | **HULL** *add 1 m.* | **SUNDERLAND** *add 5 m.*

BRITISH AND IRISH PORTS.

AUGUST, 1869.

THURSO.

																MORNING.				AFTERNOON.				
		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.				
		H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.			
•	1	9	5	10	0	9	35	11	8	0	12	9	8	30	12	7	1	50	9	2	20	9		
M.	2	10	9	9	10	10	43	9	10	9	2	12	6	9	38	12	6	2	54	9	5	3	33	9
Tu.	3	11	17	9	11	11	51	10	2	10	12	12	7	10	45	12	9	4	10	9	4	4	45	9
W.	4	—	—	—	—	0	24	10	5	11	17	13	0	11	48	13	4	5	19	9	7	5	50	10
Th.	5	0	54	10	9	1	22	11	1	—	—	—	—	0	16	13	9	6	18	10	5	6	43	11
F.	6	1	48	11	5	2	12	11	10	0	42	14	3	1	7	14	9	7	5	11	7	7	26	12
S.	7	2	36	12	4	2	59	12	11	1	32	15	4	1	56	15	10	7	46	12	10	8	7	13
•	8	3	21	13	2	3	43	13	6	2	19	16	3	2	41	16	8	8	29	13	11	8	51	13
M.	9	4	6	13	9	4	29	13	11	3	3	16	11	3	25	17	1	9	13	14	0	9	36	14
Tu.	10	4	51	13	11	5	14	13	10	3	47	17	1	4	9	17	0	9	59	14	0	10	22	13
W.	11	5	37	13	9	6	1	13	7	4	28	16	11	4	57	16	9	10	46	13	8	11	11	13
Th.	12	6	25	13	5	6	49	13	1	5	19	16	6	5	45	16	2	11	36	12	11	—	—	—
F.	13	7	14	12	9	7	40	12	3	6	10	15	8	6	36	15	2	0	2	12	6	0	28	12
S.	14	8	7	11	10	8	38	11	3	7	3	14	8	7	33	14	2	0	54	11	6	1	24	11
•	15	9	10	10	10	9	46	10	6	8	5	13	8	8	39	13	3	1	55	10	7	2	30	10
M.	16	10	24	10	4	11	2	10	11	9	17	13	0	9	56	12	10	3	10	11	11	3	53	11
Tu.	17	11	39	10	3	—	—	—	10	33	12	10	11	11	8	12	11	4	32	9	8	5	9	9
W.	18	0	15	10	5	0	48	10	7	11	42	13	2	—	—	—	5	44	9	10	6	15	10	
Th.	19	1	19	10	9	1	45	11	0	0	13	13	5	0	39	13	9	6	40	10	6	7	3	10
	0	2	10	11	3	2	32	11	7	1	4	14	1	1	27	14	6	7	23	11	4	7	41	11
	1	2	53	11	10	3	11	12	1	1	49	14	10	2	8	15	2	7	58	12	2	8	15	12
	2	3	29	12	4	3	46	12	6	2	27	15	5	2	44	15	7	8	32	12	7	8	48	12
	3	4	3	12	8	4	19	12	8	3	0	15	8	3	15	15	8	9	4	12	8	9	20	12
	4	4	36	12	8	4	52	12	8	3	31	15	8	3	47	15	8	9	36	12	8	9	52	12
	5	5	8	12	6	5	23	12	5	4	3	15	7	4	18	15	5	10	7	12	5	10	24	12
12	26	5	39	12	4	5	56	12	2	4	34	15	3	4	51	15	1	10	41	12	0	10	58	11
F.	27	6	13	12	0	6	30	11	10	5	7	14	11	5	24	14	8	11	15	11	6	11	34	11
S.	28	6	47	11	7	7	5	11	4	5	42	14	5	6	2	14	1	11	53	10	11	—	—	—
•	29	7	25	11	0	7	49	10	7	6	22	13	9	6	44	13	11	0	13	10	7	0	36	10
M.	30	8	14	10	3	8	44	9	11	7	9	13	0	7	39	12	8	1	1	9	11	1	29	9
Tu.	31	9	16	9	8	9	54	9	7	8	11	12	5	8	46	12	3	2	1	9	4	2	38	9
Half Mean Spring } Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.														

Half Mean Spring
Range.

6ft. 8in.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.
1	6	1	Sub.	9	5	14	Sub.	17	3	49	Sub.	25	1	51
2	5	57		10	5	5		18	3	36		26	1	34
3	5	53		11	4	56		19	3	22		27	1	17
4	5	48		12	4	46		20	3	8		28	1	0
5	5	42		13	4	36		21	2	54		29	0	42
6	5	36		14	4	25		22	2	39		30	0	24
7	5	29		15	4	13		23	2	23		31	0	6
8	5	22		16	4	1		24	2	7				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 NORTH SHIELDS add 6 m. LITTLE add 13 m. THURSO add 16 m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	6 m 17	5 10	8 6	5 35	8 5	4 25	20 6	4 53	20 2	11 24	15 9	11 51	15 6
M.	2	7 4	6 6	8 3	6 38	8 2	5 26	20 0	6 3	19 11	—	—	0 20	15 4
Tu.	3	7 54	7 12	8 2	7 48	8 3	6 41	20 0	7 18	20 4	0 54	15 5	1 34	15 7
W.	4	8 47	8 24	8 4	8 58	8 6	7 52	20 10	8 25	21 6	2 13	15 11	2 50	16 6
Th.	5	9 44	9 30	8 9	10 0	8 11	8 54	22 2	9 21	23 0	3 25	17 3	3 57	18 0
F.	6	10 42	10 26	9 1	10 53	9 3	9 46	23 9	10 10	24 6	4 27	18 9	4 56	19 6
S.	7	11 42	11 19	9 5	11 45	9 7	10 34	25 2	10 58	25 9	5 24	20 2	5 50	20 9
S.	8	0 a 40	—	—	0 10	9 10	11 22	26 5	11 46	26 11	6 14	21 4	6 37	21 12
M.	9	1 37	0 34	10 0	0 58	10 1	—	—	0 9	27 3	7 0	22 2	7 22	22 3
Tu.	10	2 32	1 21	10 2	1 43	10 2	0 31	27 5	0 54	27 6	7 44	22 3	8 6	22 2
W.	11	3 26	2 5	10 2	2 27	10 2	1 16	27 5	1 38	27 0	8 29	21 11	8 52	21 7
Th.	12	4 18	2 50	10 1	3 13	9 11	2 0	26 6	2 23	25 11	9 15	21 1	9 37	20 5
F.	13	5 10	3 36	9 9	3 59	9 7	2 47	25 3	3 10	24 6	9 59	19 9	10 21	19 1
S.	14	6 2	4 23	9 4	4 49	9 2	3 34	23 8	4 0	22 10	10 44	18 4	11 8	17 6
S.	15	6 54	5 16	8 11	5 45	8 8	4 29	22 0	5 3	21 3	11 33	16 9	—	—
M.	16	7 47	6 19	8 6	6 56	8 4	5 41	20 10	6 23	20 7	0 2	16 3	0 37	15 11
Tu.	17	8 40	7 35	8 3	8 14	8 4	7 4	20 7	7 42	20 10	1 19	15 10	2 3	15 11
W.	18	9 32	8 51	8 5	9 26	8 6	8 19	21 2	8 51	21 8	2 43	16 3	3 21	16 9
Th.	19	10 22	9 56	8 8	10 24	8 10	9 19	22 2	9 44	22 9	3 53	17 3	4 23	17 10
F.	20	11 11	10 49	8 11	11 12	9 0	10 6	23 3	10 27	23 7	4 50	18 4	5 15	18 9
S.	21	11 57	11 33	9 1	11 54	9 2	10 47	24 0	11 6	24 4	5 37	19 2	5 58	19 6
S.	22	morn.	—	—	0 13	9 4	11 24	24 8	11 42	24 11	6 17	19 9	6 34	20 2
M.	23	0 42	0 31	9 5	0 48	9 5	11 59	25 0	—	—	6 50	20 1	7 6	20 2
Tu.	24	1 25	1 5	9 6	1 22	9 6	0 16	25 1	0 32	25 2	7 22	20 3	7 37	20 2
W.	25	2 7	1 37	9 6	1 51	9 6	0 47	25 1	1 2	25 0	7 51	20 1	8 7	19 11
Th.	26	2 48	2 6	9 6	2 22	9 5	1 17	24 9	1 33	24 5	8 24	19 8	8 40	19 4
F.	27	3 30	2 38	9 4	2 54	9 3	1 48	24 0	2 4	23 7	8 56	19 0	9 12	18 7
S.	28	4 13	3 10	9 2	3 26	9 0	2 20	23 2	2 37	22 8	9 38	18 2	9 45	17 8
S.	29	4 58	3 44	8 11	4 5	8 9	2 55	22 1	3 15	21 7	10 3	17 2	10 22	16 8
M.	30	5 45	4 26	8 8	4 51	8 6	3 36	20 11	4 3	20 4	10 44	16 1	11 8	15 6
Tu.	31	6 35	5 18	8 4	5 51	8 2	4 34	19 10	5 10	19 7	11 36	15 2	—	—
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.			

Phases of the Moon.				Moon's Declination at Noon.											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	7	10	8 Afternoon.	1	12	N. 14	9	10	N. 49	17	20	S. 18	25	0	S. 50
First Quarter	14	0	41 Afternoon.	2	15	32	10	6	0	18	20	36	26	3	N. 20
Full - - - - -	22	4	24 Morning.	3	18	11	11	0	52	19	19	52	27	7	23
Last Quarter -	30	7	58 Morning.	4	19	57	12	4	S. 14	20	18	11	28	11	12
				5	20	37	13	8	59	21	15	41	29	14	36
In Perigee - -	9	1	0 Afternoon.	6	20	1	14	13	9	22	12	33	30	17	26
In Apogee - -	25	2	0 Morning.	7	18	6	15	16	31	23	8	55	31	19	39
				8	14	57	16	18	56	24	4	57			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
S.	1	11 55	29 2	—	—	3 31	12 9	4 1	12 7	4 29	9 0	4 59	8 10	22.9
M.	2	0 26	28 8	0 58	28 5	4 35	12 6	5 11	12 6	5 30	8 9	6 1	8 9	23.9
Tu.	3	1 32	28 5	2 9	28 8	5 45	12 7	6 18	12 10	6 33	8 10	7 5	9 0	24.9
W.	4	2 46	29 3	3 24	30 1	6 51	13 1	7 22	13 5	7 38	9 2	8 10	9 5	25.9
Th.	5	4 1	31 1	4 35	32 3	7 51	13 9	8 18	14 3	8 42	9 7	9 12	9 10	26.9
F.	6	5 7	33 6	5 37	34 9	8 42	14 8	9 5	15 2	9 40	10 1	10 5	10 5	27.9
S.	7	6 5	35 10	6 31	36 10	9 29	15 7	9 52	15 11	10 27	10 8	10 49	10 11	●
S.	8	6 56	37 8	7 21	38 6	10 14	16 3	10 35	16 6	11 11	11 2	11 34	11 3	0.6
M.	9	7 44	39 1	8 5	39 4	10 56	16 9	11 17	16 10	11 57	11 4	—	—	1.6
Tu.	10	8 26	39 6	8 47	39 6	11 39	16 10	—	—	0 20	11 4	0 43	11 4	2.6
W.	11	9 9	39 2	9 30	38 8	0 3	16 9	0 27	16 7	1 6	11 3	1 30	11 2	3.6
Th.	12	9 51	37 10	10 11	36 9	0 52	16 4	1 18	15 11	1 54	11 0	2 18	10 9	4.6
F.	13	10 30	35 7	10 50	34 5	1 44	15 6	2 9	15 1	2 43	10 6	3 8	10 3	5.6
S.	14	11 12	33 1	11 36	31 10	2 35	14 7	3 5	14 1	3 34	10 0	4 3	9 9	6
S.	15	—	—	0 5	30 9	3 37	13 8	4 11	13 3	4 34	9 6	5 8	9 3	7.6
M.	16	0 38	29 9	1 15	29 3	4 50	13 1	5 29	12 11	5 42	9 1	6 17	9 0	8.6
Tu.	17	1 56	29 2	2 36	29 3	6 6	13 0	6 42	13 0	6 53	9 1	7 29	9 2	9.6
W.	18	3 16	29 8	3 56	30 3	7 16	13 2	7 47	13 5	8 4	9 3	8 38	9 5	10.6
Th.	19	4 31	31 1	5 3	32 0	8 15	13 9	8 40	14 2	9 9	9 7	9 37	9 9	11.6
F.	20	5 31	32 10	5 56	33 6	9 1	14 4	9 21	14 7	10 1	9 11	10 22	10 1	12.6
S.	21	6 19	34 2	6 40	34 8	9 41	14 10	10 0	15 0	10 39	10 3	10 57	10 5	13.6
S.	22	6 59	35 2	7 17	35 6	10 18	15 3	10 33	15 4	11 15	10 7	11 31	10 8	14.6
M.	23	7 34	35 10	7 50	36 0	10 47	15 5	11 2	15 5	11 47	10 8	—	—	15.6
Tu.	24	8 6	36 1	8 21	36 1	11 17	15 5	11 33	15 4	0 4	10 8	0 20	10 7	16.6
W.	25	8 35	35 11	8 49	35 8	11 49	15 3	—	—	0 36	10 7	0 52	10 6	17.6
Th.	26	9 4	35 5	9 18	35 0	0 5	15 2	0 22	15 0	1 8	10 5	1 25	10 3	18.6
F.	27	9 32	34 5	9 47	33 10	0 40	14 9	0 58	14 6	1 42	10 1	1 59	10 0	19.6
S.	28	10 2	33 1	10 16	32 3	1 16	14 3	1 35	14 0	2 16	9 10	2 34	9 8	20.6
S.	29	10 32	31 4	10 50	30 5	1 55	13 8	2 17	13 4	2 54	9 6	3 16	9 4	21.6
M.	30	11 12	29 6	11 38	28 9	2 41	13 0	3 10	12 8	3 40	9 2	4 9	8 11	22.6
Tu.	31	—	—	0 11	28 2	3 42	12 5	4 19	12 3	4 40	8 9	5 15	8 8	23.6
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	1	Sub.	9	5	14	Sub.	17	3	49	Sub.	25	1	51	Sub.
2	5	57		10	5	5		18	3	36		26	1	34	
3	5	53		11	4	56		19	3	22		27	1	17	
4	5	48		12	4	46		20	3	8		28	1	0	
5	5	42		13	4	36		21	2	54		29	0	42	
6	5	36		14	4	25		22	2	39		30	0	24	
7	5	29		15	4	13		23	2	23		31	0	6	
8	5	22		16	4	1		24	2	7					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
♄.	1	6m 17	4 12	8 3	4 41	8 2	1 37	5 7	2 12	5 6	11 10	8 4	11 42	8 3
M.	2	7 4	5 11	8 1	5 42	8 0	2 47	5 7	3 20	5 8	—	—	0 15	8 3
Tu.	3	7 54	6 15	8 0	6 50	8 0	3 51	5 10	4 21	6 1	0 49	8 4	1 23	8 3
W.	4	8 47	7 24	8 1	7 56	8 3	4 48	6 3	5 13	6 5	1 57	8 7	2 29	8 11
Th.	5	9 44	8 24	8 5	8 51	8 8	5 38	6 7	6 2	6 10	2 56	9 3	3 21	9 8
F.	6	10 42	9 16	8 11	9 41	9 2	6 27	7 0	6 52	7 3	3 44	10 0	4 7	10 5
S.	7	11 42	10 5	9 4	10 28	9 6	7 17	7 6	7 41	7 8	4 31	10 10	4 55	11 2
♄.	8	0a 40	10 51	9 7	11 13	9 8	8 4	7 11	8 26	8 1	5 19	11 6	5 42	11 8
M.	9	1 37	11 34	9 8	11 55	9 9	8 47	8 2	9 7	8 1	6 4	11 10	6 26	11 12
Tu.	10	2 32	—	—	0 18	9 9	9 27	8 1	9 48	8 0	6 48	11 9	7 11	11 7
W.	11	3 26	0 42	9 9	1 6	9 8	10 10	7 10	10 33	7 8	7 34	11 4	7 57	11 1
Th.	12	4 18	1 31	9 7	1 57	9 5	10 57	7 5	11 23	7 2	8 20	10 9	8 45	10 5
F.	13	5 10	2 24	9 3	2 51	9 1	11 53	6 10	—	—	9 11	10 0	9 40	9 8
S.	14	6 2	3 19	8 11	3 47	8 9	0 26	6 6	1 3	6 3	10 12	9 4	10 45	9 1
♄.	15	6 54	4 16	8 7	4 50	8 5	1 41	6 1	2 23	5 11	11 21	8 10	11 57	8 8
M.	16	7 47	5 24	8 3	5 59	8 2	3 1	5 11	3 37	6 0	—	—	0 34	8 8
Tu.	17	8 40	6 37	8 1	7 14	8 1	4 10	6 1	4 41	6 2	1 11	8 7	1 47	8 7
W.	18	9 32	7 50	8 2	8 21	8 4	5 9	6 4	5 35	6 5	2 23	8 9	2 53	9 9
Th.	19	10 22	8 48	8 6	9 13	8 8	6 10	6 6	6 24	6 8	3 19	9 3	3 43	9 6
F.	20	11 11	9 36	8 10	9 58	8 11	6 47	6 10	7 9	6 11	4 4	9 10	4 24	10 1
S.	21	11 57	10 17	9 1	10 36	9 2	7 30	7 1	7 50	7 2	4 43	10 4	5 3	10 6
♄.	22	morn.	10 54	9 2	11 10	9 3	8 8	7 3	8 23	7 5	5 22	10 8	5 39	10 9
M.	23	0 42	11 25	9 3	11 40	9 3	8 38	7 5	8 52	7 5	5 55	10 10	6 10	10 13
Tu.	24	1 25	11 55	9 3	—	—	9 7	7 4	9 22	7 3	6 25	10 9	6 41	10 8
W.	25	2 7	0 11	9 3	0 27	9 2	9 35	7 2	9 50	7 1	6 56	10 7	7 12	10 9
Th.	26	2 48	0 44	9 2	1 1	9 1	10 5	6 11	10 21	6 10	7 29	10 2	7 45	9 13
F.	27	3 30	1 18	9 0	1 36	8 11	10 38	6 8	10 55	6 6	8 0	9 9	8 17	9 6
S.	28	4 13	1 56	8 10	2 16	8 9	11 16	6 4	11 40	6 1	8 36	9 3	8 57	9 9
♄.	29	4 58	2 37	8 7	3 c	8 5	—	—	0 8	5 10	9 21	8 9	9 47	8 6
M.	30	5 45	3 24	8 3	3 51	8 2	0 38	5 8	1 13	5 6	10 19	8 4	10 52	8 2
Tu.	31	6 35	4 21	8 1	4 56	8 0	1 51	5 5	2 31	5 5	11 28	8 1	—	—

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New - - - - -	7	10	8	Afternoon.
First Quarter	14	0	41	Afternoon.
Full - - - - -	22	4	24	Morning.
Last Quarter -	30	7	58	Morning.
<hr/>				
In Perigee - -	9	1	0	Afternoon.
In Apogee - -	25	2	0	Morning.

M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'
1	12	N. 14	9	10	N. 49	17	20	S. 18	25	0	S. 50
2	15	32	10	6	0	18	20	36	26	3	N. 20
3	18	11	11	0	52	19	19	52	27	7	25
4	19	57	12	4	S. 14	20	18	11	28	11	12
5	20	37	13	8	59	21	15	41	29	14	36
6	20	1	14	13	9	22	12	33	30	17	26
7	18	6	15	16	31	23	8	55	31	19	29
8	14	57	16	18	56	24	4	57			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
BELFAST subtract 2m. | LONDONDERRY add 4m. | SLIGO BAY add 9m.

AUGUST, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.		
	1	10 19 10 10	10 51 10 9	10 20 9 2	10 50 9 1	10 42 10 1	11 12 9 11	22.9						
M.	2	11 26 10 9	— —	11 23 9 0	11 58 9 0	11 42 9 10	— —	23.9						
Tu.	3	0 1 10 10	0 35 11 0	— —	0 34 9 2	0 13 9 9	0 46 9 11	24.9						
W.	4	1 9 11 3	1 40 11 8	1 10 9 4	1 47 9 7	1 20 10 1	1 55 10 4	25.9						
Th.	5	2 8 12 2	2 36 12 8	2 21 9 10	2 51 10 3	2 31 10 8	3 5 11 0	26.9						
F.	6	3 2 13 1	3 27 13 8	3 20 10 7	3 47 11 0	3 36 11 4	4 6 11 9	27.9						
S.	7	3 51 14 1	4 14 14 7	4 13 11 4	4 38 11 8	4 34 12 1	5 1 12 4	●						
	8	4 37 15 1	5 0 15 5	5 2 11 11	5 27 12 2	5 25 12 7	5 48 12 10	0.6						
M.	9	5 23 15 8	5 46 15 9	5 50 12 4	6 13 12 5	6 11 13 0	6 33 13 1	1.6						
Tu.	10	6 9 15 9	6 32 15 8	6 35 12 5	6 57 12 5	6 56 13 2	7 18 13 2	2.6						
W.	11	6 55 15 6	7 19 15 2	7 20 12 3	7 43 12 0	7 41 13 1	8 3 12 11	3.6						
Th.	12	7 44 14 10	8 9 14 4	8 6 11 9	8 29 11 5	8 25 12 9	8 47 12 5	4.6						
F.	13	8 33 13 9	8 59 13 1	8 50 11 1	9 12 10 9	9 7 12 1	9 28 11 9	5.6						
S.	14	9 27 12 6	9 56 12 0	9 36 10 4	10 1 10 0	9 51 11 5	10 18 11 0	6.6						
	15	10 29 11 7	11 5 11 4	10 29 9 8	11 4 9 5	10 51 10 7	11 25 10 3	7.6						
M.	16	11 44 11 2	— —	11 41 9 4	— —	11 59 10 1	— —	8.6						
Tu.	17	0 23 11 2	0 59 11 3	0 21 9 3	1 0 9 4	0 34 10 0	1 10 10 1	9.6						
W.	18	1 34 11 6	2 4 11 9	1 40 9 5	2 17 9 7	1 48 10 2	2 27 10 5	10.6						
Th.	19	2 33 12 1	2 59 12 5	2 48 9 10	3 17 10 1	3 1 10 8	3 32 10 11	11.6						
F.	20	3 23 12 9	3 44 13 0	3 42 10 4	4 5 10 7	4 0 11 1	4 25 11 4	12.6						
S.	21	4 4 13 4	4 23 13 7	4 26 10 10	4 46 11 0	4 48 11 6	5 9 11 8	13.6						
	22	4 41 13 11	4 57 14 1	5 5 11 2	5 23 11 3	5 28 11 9	5 45 11 10	○						
M.	23	5 13 14 2	5 30 14 3	5 40 11 4	5 57 11 4	6 1 11 11	6 18 12 0	15.6						
Tu.	24	5 47 14 3	6 3 14 2	6 14 11 4	6 29 11 4	6 34 12 1	6 50 12 1	16.6						
W.	25	6 17 14 1	6 33 13 11	6 43 11 4	6 59 11 3	7 5 12 1	7 20 12 0	17.6						
Th.	26	6 50 13 9	7 6 13 6	7 15 11 1	7 31 10 11	7 36 11 11	7 51 11 10	18.6						
F.	27	7 23 13 3	7 41 13 0	7 47 10 9	8 3 10 6	8 6 11 8	8 21 11 6	19.6						
S.	28	8 0 12 7	8 20 12 2	8 19 10 4	8 35 10 1	8 37 11 4	8 53 11 1	20.6						
	29	8 41 11 8	9 3 11 3	8 54 9 10	9 15 9 6	9 10 10 10	9 28 10 7	21.6						
M.	30	9 30 10 11	10 0 10 8	9 37 9 3	10 2 9 1	9 53 10 3	10 23 10 0	22.6						
Tu.	31	10 36 10 6	11 15 10 6	10 35 8 11	11 13 8 10	10 57 9 9	11 32 9 8	23.6						
Half Mean Spring } Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	1	Sub.	9	5	14	Sub.	17	3	49	Sub.	25	1	51	Sub.
2	5	57		10	5	5		18	3	36		26	1	34	
3	5	53		11	4	56		19	3	22		27	1	17	
4	5	48		12	4	46		20	3	8		28	1	0	
5	5	42		13	4	36		21	2	54		29	0	42	
6	5	36		14	4	25		22	2	39		30	0	24	
7	5	29		15	4	13		23	2	23		31	0	6	
8	5	22		16	4	1		24	2	7					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

SEPTEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.								
W.	1	7m29	10 53 13 5	11 38 13 9	—	—	0 11 12 1	6 2 9 9	6 42 9 10																	
Th.	2	8 25	—	—	0 19 14 3	0 53 11 11	1 37 12 8	7 26 10 0	8 6 10 5																	
F.	3	9 23	0 54 15 1	1 26 15 11	2 18 12 7	2 56 13 8	8 45 10 10	9 18 11 4																		
S.	4	10 22	1 54 16 11	2 19 17 11	3 32 13 8	4 3 14 10	9 48 11 9	10 14 12 2																		
S.	5	11 20	2 42 18 11	3 4 19 8	4 30 14 8	4 57 15 9	10 38 12 7	11 1 12 11																		
M.	6	0a17	3 27 20 4	3 50 20 9	5 22 15 5	5 47 16 5	11 23 13 3	11 46 13 6																		
Tu.	7	1 13	4 14 21 1	4 35 21 3	6 12 16 0	6 35 16 10	—	—	0 10 13 9																	
W.	8	2 7	4 57 21 3	5 20 21 1	6 57 16 3	7 19 16 9	0 34 13 8	0 57 13 8																		
Th.	9	3 1	5 41 20 9	6 2 20 3	7 41 16 2	8 2 16 4	1 20 13 7	1 42 13 6																		
F.	10	3 55	6 24 19 8	6 45 18 10	8 23 15 8	8 44 15 6	2 3 13 3	2 25 13 3																		
S.	11	4 49	7 7 17 11	7 31 16 11	9 3 14 11	9 22 14 6	2 46 12 8	3 8 12 1																		
S.	12	5 42	7 56 15 11	8 24 15 0	9 44 14 0	10 8 13 5	3 31 11 9	3 55 11 4																		
M.	13	6 36	8 54 14 3	9 30 13 9	10 34 13 1	11 2 12 5	4 21 10 10	4 50 10 3																		
Tu.	14	7 28	10 12 13 5	10 58 13 2	11 34 12 5	—	—	5 24 10 1	6 3 9 10																	
W.	15	8 19	11 42 13 4	—	0 14 11 10	0 56 12 3	6 47 9 9	7 29 9 10																		
Th.	16	9 8	0 22 13 8	0 58 14 2	1 37 12 0	2 17 12 9	8 10 10 1	8 48 10 5																		
F.	17	9 55	1 28 14 10	1 53 15 5	2 53 12 7	3 26 13 7	9 20 10 9	9 47 11 0																		
S.	18	10 40	2 15 16 1	2 34 16 8	3 52 13 3	4 17 14 3	10 10 11 3	10 29 11 7																		
S.	19	11 23	2 51 17 3	3 8 17 9	4 39 13 10	4 59 14 9	10 47 11 10	11 4 12 0																		
M.	20	morn.	3 25 18 0	3 41 18 3	5 18 14 4	5 35 15 1	11 21 12 1	11 37 12 3																		
Tu.	21	0 5	3 56 18 6	4 12 18 7	5 51 14 8	6 7 15 4	11 52 12 4	—																		
W.	22	0 47	4 27 18 7	4 41 18 7	6 23 14 10	6 38 15 3	0 8 12 5	0 24 12 5																		
Th.	23	1 28	4 56 18 7	5 11 18 5	6 52 14 9	7 6 14 11	0 40 12 4	0 56 12 4																		
F.	24	2 11	5 25 18 2	5 40 17 11	7 19 14 6	7 32 14 6	1 11 12 3	1 27 12 2																		
S.	25	2 55	5 55 17 8	6 11 17 2	7 48 14 2	8 3 13 11	1 41 12 1	1 56 11 11																		
S.	26	3 41	6 28 16 8	6 46 16 1	8 18 13 8	8 33 13 5	2 12 11 9	2 29 11 6																		
M.	27	4 29	7 7 15 5	7 30 14 10	8 50 13 2	9 10 12 9	2 47 11 3	3 7 11 0																		
Tu.	28	5 20	7 55 14 2	8 24 13 8	9 34 12 8	9 58 12 2	3 28 10 9	3 52 10 5																		
W.	29	6 14	8 58 13 4	9 39 13 2	10 25 12 3	10 58 11 8	4 20 10 2	4 53 9 11																		
Th.	30	7 9	10 24 13 4	11 10 13 9	11 39 12 2	—	—	5 32 9 9	6 14 9 10																	
Half Mean Spring } Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
New - - - - - 6 6 7 Morning.												1 20 N.34 9 7 S.33 17 16 S.25 25 13 N.55														
First Quarter - 12 9 23 Afternoon.												2 20 29 10 12 5 18 13 25 26 16 54														
Full - - - - - 20 8 41 Afternoon.												3 19 8 11 15 48 19 9 53 27 19 10														
Last Quarter - 28 9 10 Afternoon.												4 16 30 12 18 33 20 5 58 28 20 32														
In Perigee - - 6 8 0 Afternoon.												5 12 44 13 20 12 21 1 51 29 20 51														
In Apogee - - 21 8 0 Morning.												6 8 4 14 20 45 22 2 N.21 30 19 58														
												7 2 53 15 20 14 23 6 29														
												8 2 S.27 16 18 45 24 10 23														

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—
BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

SEPTEMBER, 1869.

WEEK DAY.		MONTH DAY.		DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
				Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		
				H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
W.	1	5	33	14	0	6	10	14	1	7	11	12	10	7	52	12	10	8	40	16	3	9	20	16	3	24.6		
Th.	2	6	52	14	5	7	32	15	0	8	34	13	0	9	17	13	3	10	1	16	6	10	41	16	11	25.6		
F.	3	8	9	15	8	8	41	16	4	9	56	13	8	10	30	14	2	11	20	17	5	11	55	17	11	26.6		
S.	4	9	11	17	1	9	38	17	9	11	0	14	8	11	28	15	1	—	—	—	—	0	26	18	7	27.6		
S.	5	10	4	18	6	10	28	19	1	11	52	15	7	—	—	—	—	0	55	19	2	1	20	19	9	28.6		
M.	6	10	53	19	7	11	19	20	0	0	15	16	1	0	37	16	6	1	44	20	4	2	6	20	8	●		
Tu.	7	11	43	20	3	—	—	—	—	1	0	16	10	1	23	17	2	2	30	21	0	2	53	21	4	1.2		
W.	8	0	8	20	6	0	32	20	6	1	46	17	3	2	7	17	4	3	14	21	6	3	37	21	7	2.2		
Th.	9	0	56	20	4	1	20	20	2	2	29	17	3	2	50	17	2	3	59	21	7	4	21	21	6	3.2		
F.	10	1	43	19	10	2	5	19	5	3	10	17	0	3	31	16	8	4	42	21	4	5	3	21	1	4.2		
S.	11	2	27	18	9	2	50	18	1	3	53	16	3	4	15	15	10	5	24	20	8	5	46	20	1	5.2		
S.	12	3	12	17	4	3	36	16	7	4	38	15	3	5	2	14	9	6	9	19	4	6	32	18	8	—		
M.	13	4	2	15	10	4	29	15	1	5	28	14	2	5	58	13	9	6	58	18	0	7	27	17	5	7.2		
Tu.	14	4	59	14	6	5	34	14	1	6	32	13	3	7	10	13	0	8	0	16	10	8	39	16	6	8.2		
W.	15	6	14	14	0	6	55	14	2	7	54	12	11	8	39	12	11	9	21	16	4	10	4	16	6	9.2		
Th.	16	7	36	14	6	8	13	14	11	9	20	13	1	9	59	13	4	10	47	16	8	11	27	17	0	10.2		
F.	17	8	43	15	5	9	10	15	11	10	34	13	8	11	2	14	0	—	—	—	—	0	1	17	5	11.2		
S.	18	9	33	16	4	9	53	16	9	11	27	14	4	11	48	14	7	0	30	17	10	0	54	18	3	12.2		
S.	19	10	13	17	2	10	32	17	6	—	—	—	—	0	6	14	11	1	16	18	8	1	37	19	0	13.2		
M.	20	10	50	17	9	11	8	18	0	0	24	15	2	0	41	15	5	1	55	19	3	2	11	19	6	○		
Tu.	21	11	25	18	2	11	42	18	3	0	58	15	7	1	14	15	9	2	27	19	8	2	43	19	9	15.2		
W.	22	11	59	18	4	—	—	—	—	1	28	15	10	1	43	15	10	2	57	19	10	3	12	19	11	16.2		
Th.	23	0	15	18	4	0	31	18	4	1	58	15	10	2	13	15	10	3	28	20	0	3	42	19	11	17.2		
F.	24	0	48	18	2	1	4	18	1	2	28	15	9	2	42	15	8	3	58	19	11	4	13	19	10	18.2		
S.	25	1	20	17	11	1	36	17	8	2	56	15	7	3	10	15	4	4	26	19	9	4	41	19	7	19.2		
S.	26	1	53	17	5	2	11	17	1	3	25	15	2	3	41	14	11	4	58	19	5	5	14	19	1	20.2		
M.	27	2	29	16	8	2	48	16	1	3	58	14	8	4	17	14	3	5	30	18	9	5	48	18	3	21.2		
Tu.	28	3	9	15	8	3	33	15	2	4	37	13	11	5	0	13	7	6	9	17	9	6	33	17	4	—		
W.	29	4	0	14	9	4	30	14	3	5	28	13	3	5	59	13	0	6	58	16	11	7	28	16	7	23.2		
Th.	30	5	6	14	0	5	44	14	1	6	37	12	9	7	20	12	9	8	4	16	3	8	46	16	2	24.2		
Half Mean Spring } Range.				9ft. 4in.								8ft. 0in.								10ft. 1½in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
I	O	13		9	2	51		17	5	39		25	8	27	
2	O	32		IO	3	II		18	6	O		26	8	47	
3	O	5I		II	3	32		19	6	21		27	9	7	
4	I	IO		12	3	53		20	6	42		28	9	27	
5	I	3O		13	4	14		21	7	3		29	9	47	
6	I	5O		14	4	35		22	7	24		30	10	6	
7	2	IO		15	4	56		23	7	45					
8	2	3O		16	5	17		24	8	6					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

SEPTEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.						HULL.						SUNDERLAND.						
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		
		H. M.	H. M.	F. I.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	7m29	6 17	9 6	6 59	9 6	0 55	15 11	1 30	15 10	10 20	10 8	11 0	10 9							
Th.	2	8 25	7 42	9 8	8 25	9 10	2 8	16 0	2 47	16 6	11 41	11 0	—	—							
F.	3	9 23	9 3	10 1	9 37	10 5	3 24	17 2	3 59	18 0	0 16	11 6	0 49	12 0							
S.	4	10 22	10 9	10 9	10 39	11 1	4 29	18 9	4 57	19 6	1 19	12 7	1 48	13 1							
♄.	5	11 20	11 4	11 5	11 28	11 9	5 21	20 2	5 44	20 10	2 15	13 8	2 40	14 2							
M.	6	0a17	11 51	12 0	—	—	6 7	21 5	6 31	21 11	3 2	14 8	3 24	15 0							
Tu.	7	1 13	0 13	12 2	0 35	12 3	6 54	22 4	7 17	22 8	3 46	15 5	4 8	15 8							
W.	8	2 7	0 58	12 4	1 21	12 4	7 40	22 9	8 2	22 9	4 30	15 10	4 52	15 9							
Th.	9	3 1	1 43	12 3	2 6	12 2	8 24	22 7	8 45	22 4	5 14	15 6	5 36	15 3							
F.	10	3 55	2 28	12 0	2 50	11 10	9 7	21 10	9 29	21 3	5 58	14 11	6 21	14 6							
S.	11	4 49	3 12	11 7	3 33	11 4	9 51	20 6	10 13	19 9	6 45	14 0	7 9	13 3							
♄.	12	5 42	3 54	11 0	4 17	10 8	10 38	19 0	11 7	18 2	7 34	12 10	8 1	12 4							
M.	13	6 36	4 42	10 4	5 10	10 1	11 41	17 5	—	—	8 30	11 10	9 3	11 4							
Tu.	14	7 28	5 40	9 10	6 17	9 8	0 16	16 9	0 53	16 3	9 41	11 0	10 22	10 9							
W.	15	8 19	7 1	9 7	7 47	9 7	1 31	16 0	2 12	16 0	11 5	10 8	11 43	10 13							
Th.	16	9 8	8 27	9 8	9 6	9 10	2 50	16 3	3 27	16 8	—	—	0 19	11 1							
F.	17	9 55	9 41	10 1	10 11	10 4	4 2	17 2	4 31	17 9	0 53	11 6	1 21	11 10							
S.	18	10 40	10 38	10 6	10 59	10 8	4 56	18 3	5 16	18 8	1 48	12 3	2 11	12 7							
♄.	19	11 23	11 18	10 11	11 36	11 1	5 35	19 1	5 53	19 5	2 30	12 11	2 49	13 2							
M.	20	morn.	11 54	11 3	—	—	6 11	19 8	6 28	19 11	3 6	13 5	3 21	13 7							
Tu.	21	0 5	0 11	11 3	0 27	11 4	6 44	20 2	7 0	20 4	3 37	13 10	3 51	14 0							
W.	22	0 47	0 41	11 5	0 56	11 5	7 16	20 5	7 32	20 6	4 6	14 1	4 21	14 2							
Th.	23	1 28	1 12	11 4	1 27	11 4	7 46	20 6	8 1	20 5	4 36	14 2	4 51	14 9							
F.	24	2 11	1 42	11 3	1 57	11 2	8 15	20 3	8 30	20 2	5 5	13 11	5 20	13 9							
S.	25	2 55	2 12	11 1	2 28	11 0	8 45	19 10	9 1	19 6	5 36	13 6	5 52	13 2							
♄.	26	3 41	2 44	10 10	3 0	10 8	9 17	19 1	9 34	18 8	6 9	12 11	6 28	12 7							
M.	27	4 29	3 16	10 6	3 34	10 4	9 52	18 2	10 13	17 8	6 48	12 3	7 9	11 11							
Tu.	28	5 20	3 53	10 1	4 15	9 11	10 38	17 2	11 8	16 8	7 32	11 7	8 0	11 3							
W.	29	6 14	4 41	9 9	5 10	9 7	11 43	16 3	—	—	8 31	11 0	9 8	10 9							
Th.	30	7 9	5 44	9 6	6 26	9 6	0 21	15 11	1 1	15 9	9 51	10 8	10 33	10 9							
Half Mean Spring } Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.										
Phases of the Moon.							Moon's Declination at Noon.														
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'			
New - - - - -	6	6	7	Morning.	1	20 N.34	9	7	8.33	17	16	8.25	25	13	N.57						
First Quarter -	12	9	23	Afternoon.	2	20 29	10	12	5	18	13	25	26	16	34						
Full - - - - -	20	8	41	Afternoon.	3	19 8	11	15	48	19	9	53	27	19	13						
Last Quarter -	28	9	10	Afternoon.	4	16 30	12	18	33	20	5	58	28	20	35						
							5	12	44	13	20	12	21	1	51	29	20	51			
In Perigee - -	6	8	0	Afternoon.	6	8 4	14	20	45	22	2	N.21	30	19	58						
In Apogee - -	21	8	0	Morning.	7	2 53	15	20	14	23	6	29									
							8	2	8.27	16	18	45	24	10	23						

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

SEPTEMBER, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
W.	1	10 33 9 8	11 13 9 10	9 27 12 3	10 8 12 4	3 22 9 2	4 5 9 2	24.6																		
Th.	2	11 54 10 1	— —	10 47 12 7	11 23 13 0	4 48 9 4	5 25 9 8	25.6																		
F.	3	0 30 10 6	1 2 10 11	11 56 13 6	— —	5 58 10 3	6 26 10 11	26.6																		
S.	4	1 30 11 5	1 56 11 11	0 24 14 2	0 50 14 9	6 49 11 7	7 10 12 4	27.6																		
S.	5	2 19 12 6	2 41 13 1	1 14 15 6	1 37 16 2	7 30 13 1	7 50 13 9	28.6																		
M.	6	3 2 13 7	3 23 14 0	1 59 16 9	2 22 17 2	8 10 14 2	8 31 14 6	●																		
Tu.	7	3 46 14 4	4 9 14 6	2 44 17 6	3 5 17 8	8 53 14 8	9 15 14 9	1.2																		
W.	8	4 32 14 7	4 55 14 5	3 27 17 9	3 49 17 8	9 38 14 8	10 2 14 5	2.2																		
Th.	9	5 18 14 3	5 40 14 1	4 12 17 5	4 35 17 2	10 25 14 2	10 47 13 9	3.2																		
F.	10	6 2 13 9	6 25 13 5	4 57 16 10	5 19 16 5	11 10 13 3	11 34 12 9	4.2																		
S.	11	6 47 12 11	7 11 12 5	5 43 15 11	6 8 15 3	11 59 12 1	— —	5.2																		
S.	12	7 37 11 10	8 5 11 2	6 33 14 8	7 0 14 0	0 25 11 6	0 52 10 11	6																		
M.	13	8 37 10 7	9 13 10 1	7 33 13 5	8 8 12 10	1 23 10 4	1 58 9 10	7.2																		
Tu.	14	9 54 9 10	10 35 9 9	8 46 12 6	9 29 12 4	2 38 9 5	3 24 9 3	8.2																		
W.	15	11 17 9 9	11 56 9 11	10 11 12 3	10 49 12 5	4 10 9 1	4 50 9 1	9.2																		
Th.	16	— —	0 33 10 1	11 26 12 7	12 0 12 11	5 28 9 3	6 1 9 7	10.2																		
F.	17	1 5 10 4	1 32 10 8	— —	0 26 13 4	6 28 10 1	6 49 10 7	11.2																		
S.	18	1 55 11 0	2 15 11 4	0 49 13 9	1 10 14 3	7 7 11 1	7 23 11 7	12.2																		
S.	19	2 34 11 9	2 50 12 1	1 29 14 8	1 47 15 1	7 38 12 0	7 53 12 4	13.2																		
M.	20	3 6 12 4	3 21 12 7	2 4 15 4	2 20 15 7	8 8 12 7	8 23 12 9	○																		
Tu.	21	3 37 12 9	3 52 12 10	2 35 15 9	2 49 15 11	8 37 12 11	8 51 12 11	15.2																		
W.	22	4 7 12 11	4 23 12 11	3 3 16 0	3 18 15 11	9 6 12 11	9 22 12 10	16.2																		
Th.	23	4 38 12 10	4 54 12 9	3 33 15 10	3 48 15 9	9 38 12 9	9 53 12 7	17.2																		
F.	24	5 9 12 7	5 24 12 5	4 3 15 7	4 19 15 5	10 9 12 5	10 25 12 2	18.2																		
S.	25	5 40 12 3	5 56 12 1	4 34 15 3	4 50 15 0	10 41 11 11	10 59 11 7	19.2																		
S.	26	6 13 11 10	6 30 11 7	5 7 14 9	5 26 14 6	11 18 11 3	11 38 10 11	20.2																		
M.	27	6 49 11 3	7 11 10 10	5 46 14 1	6 8 13 7	11 59 10 5	— —	21.2																		
Tu.	28	7 36 10 6	8 6 10 1	6 32 13 3	7 0 12 10	0 23 10 1	0 52 9 9	☾																		
W.	29	8 39 9 9	9 18 9 7	7 34 12 6	8 12 12 3	1 25 9 5	2 3 9 3	23.2																		
Th.	30	10 3 9 7	10 45 9 9	8 57 12 2	9 40 12 4	2 48 9 1	3 37 9 2	24.2																		
Half Mean Spring } Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	0	13		9	2	51		17	5	39		25	8	27	
2	0	32		10	3	11		18	6	0		26	8	47	
3	0	51		11	3	32		19	6	21		27	9	7	
4	1	10		12	3	53		20	6	42		28	9	27	
5	1	30		13	4	14		21	7	3		29	9	47	
6	1	50		14	4	35		22	7	24		30	10	6	
7	2	10		15	4	56		23	7	45					
8	2	30		16	5	17		24	8	6					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

TIDE TABLES FOR THE

SEPTEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	7m29	6 28	8 1	7 8	8 1	5 52	19 6	6 37	19 9	0 10	15 1	0 49	15 2
Th.	2	8 25	7 51	8 2	8 31	8 5	7 20	20 3	7 59	21 0	1 37	15 5	2 21	16 0
F.	3	9 23	9 7	8 8	9 39	8 11	8 34	21 10	9 3	22 10	3 1	16 11	3 35	17 10
S.	4	10 22	10 9	9 2	10 35	9 4	9 29	23 10	9 53	24 10	4 7	18 10	4 36	19 9
♄.	5	11 20	11 1	9 7	11 25	9 10	10 16	25 9	10 39	26 6	5 4	20 8	5 30	21 5
M.	6	0a17	11 50	10 0	—	—	11 2	27 3	11 26	27 10	5 54	22 1	6 17	22 8
Tu.	7	1 13	0 14	10 2	0 37	10 4	11 49	28 3	—	—	6 40	23 0	7 2	23 3
W.	8	2 7	1 0	10 5	1 24	10 5	0 12	28 6	0 35	28 6	7 24	23 2	7 46	23 11
Th.	9	3 1	1 47	10 5	2 7	10 4	0 57	28 3	1 18	27 10	8 8	22 8	8 30	22 1
F.	10	3 55	2 28	10 3	2 49	10 1	1 39	27 3	2 0	26 6	8 52	21 7	9 13	20 9
S.	11	4 49	3 10	9 10	3 31	9 7	2 21	25 7	2 43	24 8	9 33	19 11	9 54	19 0
♄.	12	5 42	3 54	9 4	4 18	9 1	3 5	23 7	3 29	22 6	10 16	18 1	10 40	17 2
M.	13	6 36	4 45	8 10	5 15	8 6	3 58	21 7	4 31	20 7	11 5	16 2	11 35	15 7
Tu.	14	7 28	5 49	8 4	6 29	8 1	5 10	20 0	5 54	19 8	—	—	0 11	15 2
W.	15	8 19	7 13	8 0	7 54	8 1	6 41	19 8	7 23	19 10	0 55	15 0	1 41	15 1
Th.	16	9 8	8 34	8 2	9 11	8 4	8 2	20 4	8 37	20 11	2 25	15 6	3 5	16 3
F.	17	9 55	9 41	8 6	10 8	8 8	9 5	21 7	9 29	22 3	3 37	16 9	4 6	17 4
S.	18	10 40	10 30	8 10	10 50	8 11	9 50	22 10	10 8	23 5	4 30	17 11	4 53	18 6
♄.	19	11 23	11 10	9 1	11 29	9 2	10 25	23 11	10 42	24 4	5 14	19 1	5 34	19 6
M	20	morn.	11 47	9 3	—	—	10 59	24 8	11 15	25 0	5 51	19 10	6 7	20 1
Tu.	21	0 5	0 4	9 5	0 20	9 6	11 31	25 3	11 47	25 5	6 22	20 4	6 38	20 4
W.	22	0 47	0 36	9 7	0 52	9 7	—	—	0 2	25 6	6 53	20 7	7 8	20 7
Th.	23	1 28	1 7	9 8	1 23	9 8	0 17	25 6	0 33	25 5	7 23	20 6	7 38	20 5
F.	24	2 11	1 38	9 7	1 52	9 7	0 48	25 3	1 2	25 0	7 52	20 1	8 8	19 10
S.	25	2 55	2 6	9 6	2 22	9 5	1 17	24 8	1 32	24 2	8 24	19 6	8 40	19 1
♄.	26	3 41	2 38	9 3	2 54	9 2	1 48	23 9	2 4	23 2	8 56	18 8	9 13	18 1
M.	27	4 29	3 11	9 0	3 30	8 10	2 22	22 7	2 41	21 11	9 31	17 6	9 50	16 11
Tu.	28	5 20	3 52	8 9	4 17	8 7	3 3	21 3	3 28	20 7	10 13	16 5	10 38	15 9
W.	29	6 14	4 45	8 5	5 18	8 3	3 59	20 1	4 36	19 7	11 6	15 3	11 43	15 0
Th.	30	7 9	5 58	8 1	6 40	8 1	5 20	19 5	6 7	19 8	—	—	0 22	15 1

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	6	6	7	Morning.	1	20	N.34	9	7	S.33	17	16	S.25	25	13	N.53
First Quarter-	12	9	23	Afternoon.	2	20	29	10	12	5	18	13	25	26	16	S.4
Full - - - - -	20	8	41	Afternoon.	3	19	8	11	15	48	19	9	53	27	19	10
Last Quarter-	28	9	10	Afternoon.	4	16	30	12	18	33	20	5	58	28	20	32
					5	12	44	13	20	12	21	1	51	29	20	51
In Perigee - -	6	8	0	Afternoon.	6	8	4	14	20	45	22	2	N.21	30	19	58
In Apogee- -	21	8	0	Morning.	7	2	53	15	20	14	23	6	29			
					8	2	S.27	16	18	45	24	10	23			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

SEPTEMBER, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
W.	1	11	56	10	8	—	—	—	—	11	54	8	11	—	—	—	—	—	—	—	—	0	9	9	8	24.6
Th.	2	0	38	10	11	1	15	11	4	0	37	9	1	1	17	9	4	0	49	9	10	1	27	10	1	25.6
F.	3	1	48	11	11	2	17	12	7	1	57	9	9	2	31	10	2	2	6	10	6	2	42	10	11	26.6
S.	4	2	44	13	2	3	10	13	10	3	1	10	7	3	28	11	1	3	16	11	5	3	46	11	10	27.6
♄	5	3	33	14	6	3	55	15	1	3	54	11	7	4	18	11	11	4	14	12	4	4	41	12	8	28.6
M.	6	4	18	15	7	4	40	16	0	4	42	12	3	5	6	12	7	5	5	12	11	5	28	13	2	●
Tu.	7	5	3	16	4	5	26	16	6	5	29	12	9	5	52	12	10	5	51	13	5	6	14	13	6	1.2
W.	8	5	49	16	5	6	12	16	3	6	16	12	10	6	39	12	9	6	37	13	7	7	0	13	6	2.2
Th.	9	6	34	16	0	6	56	15	8	7	0	12	7	7	21	12	4	7	21	13	5	7	41	13	2	3.2
F.	10	7	19	15	2	7	42	14	7	7	42	12	0	8	3	11	7	8	2	12	11	8	22	12	7	4.2
S.	11	8	5	13	11	8	30	13	1	8	23	11	2	8	45	10	9	8	42	12	2	9	1	11	9	5.2
♄	12	8	56	12	4	9	24	11	9	9	8	10	3	9	32	9	10	9	22	11	3	9	48	10	10	♄
M.	13	9	57	11	2	10	35	10	9	9	59	9	5	10	34	9	1	10	20	10	4	10	55	10	0	7.2
Tu.	14	11	17	10	7	—	—	—	—	11	14	8	11	11	59	8	10	11	33	9	8	—	—	—	—	8.2
W.	15	0	1	10	6	0	40	10	8	—	—	—	—	0	40	8	11	0	13	9	7	0	52	9	8	9.2
Th.	16	1	18	10	11	1	51	11	3	1	21	9	1	2	0	9	3	1	31	9	9	2	9	10	1	10.2
F.	17	2	18	11	8	2	43	12	1	2	33	9	7	3	0	9	11	2	44	10	5	3	15	10	8	11.2
S.	18	3	6	12	6	3	25	12	11	3	24	10	2	3	44	10	6	3	40	10	11	4	3	11	3	12.2
♄	19	3	42	13	3	3	59	13	7	4	4	10	9	4	22	10	11	4	24	11	6	4	44	11	8	13.2
M.	20	4	16	13	10	4	32	14	1	4	39	11	2	4	56	11	4	5	2	11	10	5	18	11	11	○
Tu.	21	4	46	14	4	5	1	14	5	5	12	11	5	5	28	11	6	5	33	12	1	5	48	12	2	15.2
W.	22	5	17	14	6	5	32	14	6	5	44	11	6	5	59	11	6	6	4	12	2	6	19	12	2	16.2
Th.	23	5	48	14	5	6	4	14	3	6	15	11	6	6	30	11	5	6	35	12	2	6	51	12	2	17.2
F.	24	6	19	14	1	6	34	13	11	6	44	11	4	6	59	11	2	7	5	12	1	7	20	12	0	18.2
S.	25	6	50	13	7	7	7	13	4	7	14	11	0	7	30	10	9	7	35	11	10	7	50	11	8	19.2
♄	26	7	25	13	0	7	44	12	7	7	46	10	6	8	3	10	3	8	5	11	6	8	21	11	3	20.2
M.	27	8	5	12	0	8	28	11	6	8	21	10	0	8	41	9	8	8	38	11	0	8	56	10	8	21.2
Tu.	28	8	55	11	1	9	25	10	9	9	5	9	5	9	31	9	2	9	19	10	5	9	48	10	2	♄
W.	29	10	2	10	6	10	44	10	5	10	3	9	0	10	43	8	10	10	25	9	10	11	3	9	8	23.2
Th.	30	11	28	10	7	—	—	—	—	11	25	8	11	—	—	—	—	11	42	9	7	—	—	—	—	24.2
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	0	13	Add.	9	2	51	Add.	17	5	39	Add.	25	8	27	Add.
2	0	32		10	3	11		18	6	0		26	8	47	
3	0	51		11	3	32		19	6	21		27	9	7	
4	1	10		12	3	53		20	6	42		28	9	27	
5	1	30		13	4	14		21	7	3		29	9	47	
6	1	50		14	4	35		22	7	24		30	10	6	
7	2	10		15	4	56		23	7	45					
8	2	30		16	5	17		24	8	6					

he times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—fo
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 8 m.

SEPTEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	7m29	5 32	7 11	6 10	7 11	3 10	5 7	3 47	5 9	0 5	8 1	0 44	8 2
Th.	2	8 25	6 53	8 0	7 31	8 2	4 23	6 0	4 53	6 3	1 26	8 4	2 3	8 8
F.	3	9 23	8 4	8 4	8 33	8 7	5 20	6 6	5 45	6 9	2 37	9 1	3 4	9 7
S.	4	10 22	9 0	8 11	9 24	9 2	6 10	7 1	6 34	7 5	3 29	10 0	3 51	10 6
♄.	5	11 20	9 47	9 5	10 9	9 8	6 58	7 8	7 22	7 11	4 13	11 0	4 36	11 5
M.	6	0a 17	10 31	9 9	10 53	9 10	7 45	8 2	8 7	8 4	4 59	11 10	5 23	12 1
Tu.	7	1 13	11 15	9 11	11 36	10 0	8 28	8 6	8 48	8 6	5 45	12 3	6 6	12 3
W.	8	2 7	11 58	10 0	—	—	9 9	8 5	9 30	8 3	6 28	12 3	6 51	12 9
Th.	9	3 1	0 21	9 11	0 45	9 10	9 50	8 1	10 11	7 11	7 13	11 9	7 34	11 7
F.	10	3 55	1 8	9 9	1 31	9 7	10 33	7 8	10 56	7 4	7 56	11 0	8 18	10 7
S.	11	4 49	1 56	9 5	2 21	9 2	11 21	7 0	11 53	6 7	8 41	10 1	9 8	9 8
♄.	12	5 42	2 47	8 11	3 14	8 8	—	—	0 27	6 2	9 38	9 3	10 12	8 10
M.	13	6 36	3 45	8 5	4 18	8 3	1 6	5 10	1 48	5 8	10 48	8 6	11 27	8 3
Tu.	14	7 28	4 54	8 1	5 33	8 0	2 31	5 7	3 11	5 7	—	—	0 7	8 2
W.	15	8 19	6 15	7 11	6 55	7 11	3 50	5 9	4 25	5 10	0 49	8 2	1 28	8 2
Th.	16	9 8	7 34	8 0	8 8	8 2	4 55	6 0	5 23	6 2	2 6	8 4	2 40	8 4
F.	17	9 55	8 35	8 4	8 59	8 6	5 47	6 4	6 9	6 6	3 6	9 0	3 29	9 4
S.	18	10 40	9 20	8 9	9 38	8 11	6 30	6 9	6 49	6 11	3 47	9 7	4 5	9 11
♄.	19	11 23	9 56	9 0	10 13	9 2	7 8	7 0	7 26	7 2	4 22	10 3	4 39	10 6
M.	20	morn.	10 29	9 3	10 45	9 3	7 43	7 3	7 59	7 5	4 56	10 8	5 12	10 13
Tu.	21	0 5	10 59	9 4	11 13	9 4	8 13	7 6	8 26	7 6	5 28	10 11	5 43	11 2
W.	22	0 47	11 27	9 4	11 42	9 3	8 39	7 6	8 53	7 6	5 57	11 0	6 12	10 12
Th.	23	1 28	11 57	9 3	—	—	9 8	7 5	9 22	7 3	6 27	10 10	6 43	10 8
F.	24	2 11	0 13	9 3	0 29	9 3	9 35	7 2	9 49	7 0	6 58	10 6	7 13	10 4
S.	25	2 55	0 45	9 2	1 2	9 1	10 4	6 11	10 21	6 9	7 28	10 1	7 44	9 4
♄.	26	3 41	1 20	9 0	1 39	8 10	10 39	6 6	11 0	6 3	8 1	9 6	8 20	9 3
M.	27	4 29	2 0	8 8	2 23	8 6	11 26	6 0	11 56	5 9	8 42	8 11	9 9	8 5
Tu.	28	5 20	2 48	8 4	3 15	8 3	—	—	0 31	5 6	9 39	8 5	10 14	8 2
W.	29	6 14	3 46	8 1	4 23	8 0	1 10	5 5	1 55	5 4	10 53	8 1	11 36	8 1
Th.	30	7 9	5 3	7 11	5 44	7 11	2 40	5 5	3 21	5 8	—	—	0 18	8 2

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	6	6	7 Morning.	1	20	N. 34	9	78.	33	17	168.	25	25	13	N. 55
First Quarter	12	9	23 Afternoon.	2	20	29	10	12	5	18	13	25	26	16	54
Full - - - - -	20	8	41 Afternoon.	3	19	8	11	15	48	19	9	53	27	19	15
Last Quarter -	28	9	10 Afternoon.	4	16	30	12	18	33	20	5	58	28	20	52
				5	12	44	13	20	12	21	1	51	29	20	51
In Perigee - -	6	8	0 Afternoon.	6	8	4	14	20	45	22	2	N. 21	30	19	58
In Apogee - -	21	8	0 Morning.	7	2	53	15	20	14	23	6	29	31		
				8	2	8.27	16	18	45	24	10	23			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

TIDE TABLES FOR THE

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	8m6	11 53	14 4	—	—	0 25	11 9	1 11	12 9	6 58	10 0	7 40	10 4
S.	2	9 2	0 32	15 2	1 4	16 1	1 54	12 7	2 35	13 10	8 21	10 10	8 56	11 4
S.	3	9 59	1 32	17 1	1 57	18 2	3 11	13 9	3 40	15 0	9 24	11 10	9 52	12 4
M.	4	10 55	2 21	19 2	2 43	20 0	4 9	14 9	4 36	15 11	10 17	12 9	10 39	13 2
Tu.	5	11 50	3 5	20 9	3 27	21 1	5 2	15 8	5 26	16 8	11 1	13 6	11 23	13 8
W.	6	0a45	3 50	21 4	4 12	21 6	5 49	16 4	6 13	17 0	11 46	13 10	—	—
Th.	7	1 41	4 34	21 6	4 55	21 3	6 36	16 7	6 56	16 9	0 9	13 10	0 33	13 10
F.	8	2 36	5 17	20 9	5 38	20 3	7 16	16 4	7 37	16 2	0 55	13 8	1 17	13 1
S.	9	3 32	6 0	19 7	6 20	18 8	7 58	15 9	8 19	15 5	1 39	13 3	2 1	12 1
S.	10	4 28	6 42	17 10	7 7	16 9	8 37	15 0	8 57	14 5	2 21	12 6	2 43	12 1
M.	11	5 22	7 32	15 9	7 58	14 9	9 18	14 0	9 40	13 2	3 6	11 8	3 30	11 2
Tu.	12	6 15	8 26	13 11	9 1	13 4	10 3	13 0	10 30	12 1	3 54	10 9	4 22	10 3
W.	13	7 5	9 42	12 11	10 29	12 10	11 2	12 2	11 42	11 6	4 55	9 11	5 35	9 8
Th.	14	7 53	11 13	13 0	11 55	13 3	—	—	0 25	12 1	6 18	9 6	7 1	9 2
F.	15	8 38	—	—	0 30	13 9	1 7	11 8	1 46	12 8	7 41	9 10	8 19	10 2
S.	16	9 22	1 0	14 5	1 26	15 0	2 23	12 3	2 56	13 4	8 51	10 6	9 17	10 10
S.	17	10 4	1 46	15 9	2 6	16 4	3 23	13 0	3 47	14 0	9 40	11 2	10 1	11 5
M.	18	10 46	2 23	16 11	2 38	17 5	4 9	13 8	4 29	14 7	10 18	11 8	10 34	11 10
Tu.	19	11 27	2 54	17 10	3 11	18 3	4 47	14 3	5 4	15 0	10 50	12 0	11 6	12 2
W.	20	morn.	3 26	18 5	3 41	18 7	5 21	14 9	5 38	15 3	11 22	12 4	11 37	12 3
Th.	21	0 10	3 57	18 8	4 12	18 8	5 54	15 0	6 9	15 3	11 53	12 5	—	—
F.	22	0 53	4 28	18 8	4 42	18 6	6 24	15 1	6 39	15 0	0 9	12 5	0 26	12 4
S.	23	1 39	4 58	18 4	5 14	18 1	6 42	14 10	7 7	14 8	0 42	12 4	0 58	12 3
S.	24	2 26	5 30	17 10	5 47	17 5	7 23	14 7	7 38	14 3	1 15	12 1	1 32	12 2
M.	25	3 16	6 6	16 11	6 26	16 5	7 54	14 2	8 10	13 8	1 48	11 10	2 7	11 7
Tu.	26	4 8	6 47	15 10	7 10	15 3	8 28	13 8	8 48	13 0	2 27	11 5	2 47	11 2
W.	27	5 2	7 35	14 8	8 3	14 2	9 10	13 2	9 35	12 4	3 9	10 11	3 33	10 8
Th.	28	5 57	8 37	13 10	9 15	13 8	10 4	12 8	10 39	11 10	4 0	10 5	4 33	10 2
F.	29	6 52	10 0	13 9	10 47	14 1	11 17	12 6	—	—	5 9	10 0	5 51	10 2
S.	30	7 46	11 29	14 8	—	—	0 6	12 0	0 52	13 0	6 36	10 2	7 16	10 6
S.	31	8 40	0 5	15 5	0 37	16 3	1 36	12 9	2 15	13 11	7 54	11 0	8 28	11 5
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°
New - - - - -	5	2	19	Afternoon.	1	17	N.53	9	17	8.56	17	7	S.4	25	20
First Quarter-	12	10	2	Morning.	2	14	36	10	20	1	18	2	56	26	21
Full - - - - -	20	1	57	Afternoon.	3	10	20	11	20	56	19	1	N.18	27	20
Last Quarter -	28	8	34	Morning.	4	5	19	12	20	41	20	5	31	28	18
					5	0	8.15	13	19	25	21	9	34	29	16
In Perigee - -	5	7	0	Morning.	6	5	28	14	17	15	22	13	15	30	12
In Apogee - -	18	10	0	Morning.	7	10	27	15	14	22	23	16	26	31	7
					8	14	41	16	10	55	24	18	55		

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
.	1	11 26	10 0	—	—	10 20	12 7	10 59	13 0	4 20	9 4	5 1	9 9	25·2
.	2	0 6	10 6	0 41	11 0	11 35	13 7	—	—	5 37	10 3	6 5	10 11	26·2
.	3	1 9	11 6	1 34	12 1	0 3	14 3	0 28	14 11	6 28	11 9	6 49	12 6	27·2
L.	4	1 58	12 8	2 21	13 3	0 52	15 8	1 16	16 4	7 9	13 3	7 29	13 11	28·2
u.	5	2 41	13 9	3 2	14 3	1 38	16 11	2 0	17 5	7 49	14 5	8 10	14 9	●
V.	6	3 24	14 6	3 46	14 8	2 22	17 9	2 43	17 11	8 31	14 10	8 52	14 11	0·9
h.	7	4 8	14 9	4 30	14 8	3 3	18 0	3 26	17 10	9 15	14 10	9 37	14 8	1·9
.	8	4 52	14 5	5 15	14 1	3 48	17 8	4 10	17 3	9 59	14 3	10 22	13 9	2·9
.	9	5 38	13 8	6 0	13 3	4 32	16 10	4 55	16 4	10 45	13 2	11 8	12 7	3·9
.	10	6 21	12 10	6 44	12 4	5 17	15 10	5 40	15 3	11 32	12 1	11 58	11 4	4·9
L.	11	7 10	11 8	7 38	11 0	6 6	14 6	6 33	13 10	—	—	0 25	10 8	5·9
u.	12	8 8	10 5	8 42	9 11	7 3	13 3	7 36	12 8	0 54	10 1	1 27	9 7)
V.	13	9 23	9 7	10 6	9 5	8 15	12 3	8 59	12 0	2 6	9 2	2 53	8 11	7·9
h.	14	10 49	9 5	11 31	9 7	9 44	12 0	10 24	12 1	3 42	8 10	4 24	8 10	8·9
.	15	—	—	0 8	9 10	11 1	12 4	11 33	12 8	5 3	9 0	5 35	9 4	9·9
.	16	0 39	10 1	1 7	10 5	—	—	0 1	13 1	6 3	9 9	6 24	10 3	10·9
.	17	1 29	10 10	1 48	11 2	0 22	13 6	0 42	14 0	6 42	10 9	6 58	11 3	11·9
L.	18	2 6	11 6	2 23	11 10	1 1	14 5	1 18	14 10	7 12	11 8	7 26	12 1	12·9
u.	19	2 38	12 2	2 52	12 5	1 34	15 2	1 50	15 5	7 40	12 5	7 54	12 9	13·9
V.	20	3 7	12 8	3 22	12 10	2 6	15 9	2 21	15 11	8 8	12 11	8 22	13 0	○
h.	21	3 37	12 11	3 52	13 0	2 34	16 0	2 48	16 1	8 36	13 0	8 52	13 0	15·9
.	22	4 8	13 0	4 24	12 11	3 3	16 0	3 19	15 11	9 8	12 11	9 24	12 9	16·9
.	23	4 39	12 9	4 55	12 7	3 34	15 9	3 50	15 7	9 40	12 7	9 57	12 4	17·9
.	24	5 12	12 4	5 29	12 2	4 7	15 4	4 24	15 2	10 14	12 1	10 32	11 9	18·9
L.	25	5 47	12 0	6 7	11 9	4 41	14 11	5 1	14 7	10 53	11 5	11 15	11 0	19·9
u.	26	6 28	11 5	6 50	11 1	5 23	14 3	5 46	13 10	11 38	10 8	—	—	20·9
V.	27	7 15	10 9	7 44	10 4	6 11	13 6	6 38	13 2	0 3	10 4	0 30	10 0	21·9
h.	28	8 16	10 0	8 55	9 10	7 11	12 10	7 49	12 7	1 1	9 9	1 40	9 6	22·9
.	29	9 39	9 10	10 22	10 0	8 31	12 6	9 17	12 7	2 23	9 5	3 12	9 6	23·9
.	30	11 4	10 3	11 43	10 8	9 59	12 10	10 36	13 3	3 58	9 8	4 37	10 0	24·9
.	31	—	—	0 16	11 2	11 9	13 9	11 39	14 4	5 11	10 5	5 40	11 0	25·9
Half Mean Spring } Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

LD.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	25	Add.	9	12	46	Add.	17	14	38	Add.	25	15	52	Add.
2	10	44		10	13	1		18	14	49		26	15	58	
3	11	3		11	13	17		19	15	0		27	16	4	
4	11	21		12	13	31		20	15	11		28	16	8	
5	11	38		13	13	46		21	15	20		29	16	12	
6	11	56		14	14	0		22	15	29		30	16	15	
7	12	13		15	14	13		23	15	38		31	16	17	
8	12	29		16	14	26		24	15	45					

e times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 18 m | THURSO add 14 m.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.						
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
F.	1	8m 6	7	13	9	7	7	57	9	9	1	41	16	0	2	21	16	5	11	14	11	0	11	52	11	6				
S.	2	9 2	8	38	10	1	9	16	10	5	3	0	17	2	3	37	18	0	—	—	—	—	0	28	12	1				
Th.	3	9 59	9	47	10	9	10	16	11	2	4	8	18	10	4	35	19	8	0	58	12	8	1	26	13	3				
M.	4	10 55	10	41	11	6	11	5	11	10	4	59	20	6	5	22	21	2	1	53	13	10	2	18	14	5				
Tu.	5	11 50	11	28	12	1	11	51	12	4	5	45	21	9	6	8	22	4	2	40	14	10	3	2	15	3				
W.	6	0a45	—	—	—	—	0	13	12	5	6	31	22	7	6	54	22	10	3	23	15	7	3	45	15	10				
Th.	7	1 41	0	35	12	6	0	57	12	6	7	16	23	0	7	38	23	0	4	6	16	0	4	28	15	11				
F.	8	2 36	1	19	12	5	1	41	12	3	7	59	22	10	8	21	22	5	4	49	15	9	5	11	15	4				
S.	9	3 32	2	3	12	1	2	25	11	10	8	43	21	10	9	5	21	2	5	34	14	11	5	57	14	5				
Th.	10	4 28	2	47	11	6	3	8	11	3	9	26	20	4	9	48	19	8	6	19	13	10	6	42	13	4				
M.	11	5 22	3	30	10	11	3	53	10	7	10	13	18	9	10	40	17	11	7	8	12	9	7	34	12	2				
Tu.	12	6 15	4	17	10	3	4	43	9	11	11	11	17	2	11	46	16	6	8	2	11	7	8	33	11	1				
W.	13	7 5	5	12	9	8	5	47	9	6	—	—	—	—	0	25	15	11	9	11	10	9	9	53	10	6				
Th.	14	7 53	6	30	9	5	7	18	9	5	1	5	15	7	1	45	15	6	10	37	10	5	11	18	10	7				
F.	15	8 38	8	1	9	6	8	40	9	8	2	24	15	9	3	2	16	3	11	54	10	10	—	—	—	—				
S.	16	9 22	9	14	9	11	9	43	10	2	3	35	16	10	4	5	17	5	0	26	11	2	0	55	11	7				
Th.	17	10 4	10	9	10	5	10	31	10	7	4	29	17	11	4	49	18	5	1	19	12	0	1	41	12	5				
M.	18	10 46	10	50	10	10	11	7	11	0	5	7	18	10	5	24	19	3	2	2	12	9	2	20	13	3				
Tu.	19	11 27	11	24	11	2	11	40	11	3	5	40	19	7	5	56	19	10	2	36	13	3	2	52	13	6				
W.	20	morn.	11	56	11	4	—	—	—	—	6	13	20	1	6	30	20	3	3	7	13	9	3	22	13	11				
Th.	21	0 10	0	12	11	5	0	26	11	5	6	45	20	5	7	0	20	6	3	36	14	1	3	51	14	2				
F.	22	0 53	0	41	11	5	0	57	11	5	7	16	20	6	7	32	20	6	4	6	14	2	4	21	14	2				
S.	23	1 39	1	13	12	4	1	28	11	3	7	46	20	5	8	2	20	3	4	36	14	0	4	52	13	13				
Th.	24	2 26	1	44	11	2	2	1	11	0	8	18	20	0	8	35	19	8	5	9	13	8	5	26	13	5				
M.	25	3 16	2	18	10	11	2	35	10	9	8	53	19	4	9	12	18	10	5	44	13	1	6	3	12	9				
Tu.	26	4 8	2	54	10	7	3	14	10	5	9	32	18	5	9	53	17	11	6	25	12	5	6	48	12	3				
W.	27	5 2	3	34	10	2	3	56	10	0	10	16	17	6	10	45	17	1	7	12	11	10	7	39	11	6				
Th.	28	5 57	4	20	9	11	4	49	9	9	11	19	16	8	11	59	16	4	8	9	11	3	8	45	11	3				
F.	29	6 52	5	23	9	8	6	2	9	8	—	—	—	—	0	39	16	3	9	26	10	11	10	10	11	3				
S.	30	7 46	6	49	9	9	7	35	9	11	1	20	16	4	2	0	16	8	10	53	11	3	11	29	11	3				
Th.	31	8 40	8	14	10	2	8	49	10	6	2	36	17	4	3	10	18	2	—	—	—	—	0	2	12	2				

Half Mean Spring }
Range.

5 ft. 9 in.

10 ft. 5 in.

7 ft. 2 in.

Half Mean Spring } 5 ft. 9 in.
Range.

10 ft. 5 in.

7 ft. 2 in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New	5	2	19	Afternoon.
First Quarter	12	10	2	Morning.
Full	20	1	57	Afternoon.
Last Quarter	28	8	34	Morning.
In Perigee	5	7	0	Morning.
In Apogee	18	10	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	N.53	9	17	S.56	17	7	S.4	25	20	N.52
2	14	36	10	20	1	18	2	56	26	21	8
3	10	20	11	20	56	19	1	N.18	27	20	50
4	5	19	12	20	41	20	5	31	28	18	54
5	0	S.5	13	19	25	21	9	34	29	16	5
6	5	28	14	17	15	22	13	15	30	12	15
7	10	27	15	14	22	23	16	26	31	7	55
8	14	41	16	10	55	24	18	55			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.	
F.	1	1	44	28	6	2	28	29	5	5	54	12	8	6	33	13	1	6	42	8	11	7	20	9	3	25.2	
S.	2	3	11	30	10	3	48	32	3	7	9	13	8	7	38	14	3	7	57	9	7	8	29	9	11	26.2	
S.	3	4	22	33	11	4	53	35	7	8	4	14	11	8	27	15	6	8	58	10	3	9	26	10	7	27.2	
M.	4	5	22	37	2	5	48	38	5	8	49	16	2	9	11	16	8	9	50	10	11	10	10	11	3	28.2	
Tu.	5	6	13	39	7	6	37	40	2	9	33	17	1	9	55	17	4	10	31	11	6	10	52	11	9	●	
W.	6	7	0	40	10	7	22	41	4	10	16	17	7	10	35	17	9	11	14	11	10	11	36	11	11	0.9	
Th.	7	7	44	41	3	8	5	40	11	10	56	17	8	11	18	17	5	11	59	11	10	—	—	—	—	1.9	
F.	8	8	26	40	3	8	47	39	4	11	40	17	1	—	—	—	0	21	11	8	0	43	11	6	—	2.9	
S.	9	9	7	38	4	9	25	37	0	0	3	16	8	0	27	16	3	1	6	11	3	1	29	10	11	—	3.9
S.	10	9	43	35	9	10	2	34	0	0	50	15	7	1	14	15	1	1	51	10	7	2	14	10	3	—	4.9
M.	11	10	21	32	5	10	42	30	10	1	39	14	4	2	6	13	9	2	39	9	11	3	5	9	7	—	5.9
Tu.	12	11	8	29	5	11	41	28	3	2	35	13	2	3	8	12	8	3	33	9	3	4	6	8	11	—	6.9
W.	13	—	—	—	—	0	20	27	4	3	48	12	3	4	32	12	0	4	45	8	8	5	25	8	6	—	7.9
Th.	14	1	4	27	2	1	48	27	3	5	17	12	1	5	58	12	2	6	6	8	7	6	45	8	8	—	8.9
F.	15	2	29	27	9	3	7	28	7	6	35	12	5	7	7	12	9	7	22	8	10	7	55	9	0	—	9.9
S.	16	3	43	29	6	4	13	30	6	7	35	13	1	7	58	13	6	8	25	9	3	8	51	9	6	—	10.9
S.	17	4	38	31	7	5	2	32	7	8	18	13	11	8	36	14	3	9	14	9	8	9	35	9	11	—	11.9
M.	18	5	23	33	6	5	42	34	4	8	52	14	7	9	7	14	11	9	52	10	1	10	7	10	3	—	12.9
Tu.	19	6	0	34	11	6	18	35	6	9	23	15	2	9	39	15	4	10	21	10	5	10	36	10	7	—	13.9
W.	20	6	35	35	10	6	51	36	2	9	54	15	6	10	7	15	7	10	50	10	8	11	4	10	9	—	14.9
Th.	21	7	7	36	6	7	22	36	7	10	21	15	8	10	35	15	9	11	19	10	10	11	35	10	9	—	15.9
F.	22	7	37	36	7	7	52	36	5	10	50	15	8	11	4	15	7	11	51	10	9	—	—	—	—	—	16.9
S.	23	8	8	36	2	8	23	35	10	11	20	15	5	11	37	15	3	0	7	10	8	0	24	10	7	—	17.9
S.	24	8	39	35	5	8	54	34	11	11	56	15	0	—	—	—	0	41	10	6	0	58	10	4	—	—	18.9
M.	25	9	10	34	2	9	27	33	3	0	15	14	9	0	35	14	5	1	16	10	1	1	36	9	11	—	19.9
Tu.	26	9	44	32	6	10	2	31	8	0	57	14	1	1	20	13	9	1	57	9	9	2	19	9	6	—	20.9
W.	27	10	22	30	9	10	47	29	10	1	44	13	5	2	11	13	1	2	43	9	4	3	10	9	2	—	21.9
Th.	28	11	18	29	1	11	55	28	8	2	43	12	9	3	21	12	7	3	41	9	0	4	18	8	10	—	22.9
F.	29	—	—	—	—	0	36	28	8	4	4	12	6	4	50	12	8	4	59	8	9	5	40	8	10	—	23.9
S.	30	1	22	29	2	2	3	30	0	5	33	12	11	6	10	13	4	6	20	9	0	6	57	9	4	—	24.9
S.	31	2	42	31	2	3	19	32	6	6	43	13	10	7	12	14	5	7	30	9	8	8	2	9	11	—	25.9
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.									

Equation of Time at Noon.

LD.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	25	Add.	9	12	46	Add.	17	14	38	Add.	25	15	52	Add.
2	10	44		10	13	1		18	14	49		26	15	58	
3	11	3		11	13	17		19	15	0		27	16	4	
4	11	21		12	13	31		20	15	11		28	16	8	
5	11	38		13	13	46		21	15	20		29	16	12	
6	11	56		14	14	0		22	15	29		30	16	15	
7	12	13		15	14	13		23	15	38		31	16	17	
8	12	29		16	14	26		24	15	45					

e times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 18 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.						
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
F.	1	8 m6	7	23	8	2	8	5	8	4	6	53	20	2	7	34	21	0	1	8	15	5	1	54	16	0				
S.	2	9 2	8	44	8	7	9	17	8	11	8	12	22	0	8	42	23	0	2	37	16	11	3	12	18	0				
♄.	3	9 59	9	45	9	3	10	12	9	6	9	8	24	1	9	32	25	2	3	43	19	0	4	13	20	0				
M.	4	10 55	10	38	9	9	11	2	9	11	9	55	26	2	10	17	26	11	4	41	21	0	5	7	21	9				
Tu.	5	11 50	11	26	10	2	11	50	10	3	10	40	27	8	11	3	28	2	5	31	22	6	5	54	22	11				
W.	6	0a45	—	—	—	—	0	14	10	5	11	25	28	6	11	47	28	9	6	16	23	3	6	38	23	4				
Th.	7	1 41	0	37	10	6	1	0	10	6	—	—	—	—	0	10	28	9	7	0	23	6	7	22	23	2				
F.	8	2 36	1	22	10	5	1	43	10	4	0	32	28	6	0	54	27	11	7	43	22	8	8	5	22	1				
S.	9	3 32	2	5	10	2	2	27	10	0	1	15	27	2	1	36	26	4	8	27	21	5	8	48	20	7				
♄.	10	4 28	2	47	9	9	3	7	9	6	1	57	25	5	2	18	24	6	9	9	19	10	9	30	18	9				
M.	11	5 22	3	30	9	3	3	54	9	0	2	40	23	4	3	4	22	4	9	52	17	10	10	15	16	12				
Tu.	12	6 15	4	19	8	9	4	47	8	6	3	30	21	3	4	1	20	3	10	39	16	0	11	8	15	1				
W.	13	7 5	5	21	8	3	6	1	8	0	4	39	19	7	5	23	19	2	11	44	14	9	—	—	—	—				
Th.	14	7 53	6	44	7	11	7	27	7	11	6	13	19	2	6	57	19	4	0	25	14	7	1	12	14	8				
F.	15	8 38	8	7	8	1	8	42	8	3	7	36	19	10	8	11	20	5	1	56	15	0	2	34	15	7				
S.	16	9 22	9	13	8	5	9	39	8	7	8	39	21	2	9	2	21	10	3	8	16	3	3	35	17	3				
♄.	17	10 4	10	1	8	9	10	21	8	11	9	22	22	6	9	41	23	2	3	59	17	7	4	21	18	2				
M.	18	10 46	10	39	9	0	10	57	9	2	9	57	23	8	10	13	24	2	4	42	18	9	5	1	19	3				
Tu.	19	11 27	11	15	9	3	11	32	9	4	10	29	24	6	10	45	24	10	5	19	19	7	5	37	19	14				
W.	20	morn.	11	48	9	5	—	—	—	—	11	1	25	1	11	16	25	4	5	53	20	3	6	7	20	1				
Th.	21	0 10	0	4	9	6	0	20	9	7	11	32	25	6	11	48	25	6	6	23	20	7	6	38	20	7				
F.	22	0 53	0	36	9	7	0	52	9	7	—	—	—	—	0	4	25	6	6	54	20	7	7	9	20	3				
S.	23	1 39	1	8	9	7	1	24	9	6	0	19	25	5	0	35	25	2	7	25	20	3	7	41	20	3				
♄.	24	2 26	1	40	9	6	1	57	9	5	0	51	24	11	1	7	24	6	7	57	19	8	8	14	19	4				
M.	25	3 16	2	14	9	4	2	32	9	2	1	24	24	0	1	42	23	5	8	33	18	10	8	53	18	4				
Tu.	26	4 8	2	51	9	1	3	11	8	11	2	1	22	10	2	21	22	3	9	12	17	10	9	33	17	4				
W.	27	5 2	3	32	8	10	3	56	8	8	2	43	21	9	3	8	21	1	9	55	16	10	10	19	16	4				
Th.	28	5 57	4	24	8	6	4	58	8	5	3	37	20	7	4	13	20	1	10	47	15	9	11	20	15	6				
F.	29	6 52	5	35	8	4	6	17	8	3	4	55	19	11	5	42	20	1	11	59	15	7	—	—	—	—				
S.	30	7 46	7	1	8	3	7	41	8	6	6	31	20	7	7	11	21	4	0	44	15	10	1	29	16	4				
♄.	31	8 40	8	17	8	9	8	50	9	0	7	46	22	3	8	16	23	2	2	9	17	2	2	45	18	1				

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New - - - - -	5	2	19	Afternoon.
First Quarter -	12	10	2	Morning.
Full - - - - -	20	1	57	Afternoon.
Last Quarter -	28	8	34	Morning.
<hr/>				
In Perigee - -	5	7	0	Morning.
In Apogee - -	18	10	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	N.53	9	17	S.56	17	7	S.4	25	20	N.32
2	14	36	10	20	1	18	2	56	26	21	8
3	10	20	11	20	56	19	1	N.18	27	20	39
4	5	19	12	20	41	20	5	31	28	18	54
5	0	S.5	13	19	25	21	9	34	29	16	5
6	5	28	14	17	15	22	13	15	30	12	15
7	10	27	15	14	22	23	16	26	31	7	35
8	14	41	16	10	55	24	18	55			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 28 m.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.
F.	1	1	44	28	6	2	28	29	5	5	54	12	8	6	33	13	1	6	42	8	11	7	20	9	3	25.2
S.	2	3	11	30	10	3	48	32	3	7	9	13	8	7	38	14	3	7	57	9	7	8	29	9	11	26.2
S.	3	4	22	33	11	4	53	35	7	8	4	14	11	8	27	15	6	8	58	10	3	9	26	10	7	27.2
M.	4	5	22	37	2	5	48	38	5	8	49	16	2	9	11	16	8	9	50	10	11	10	10	11	3	28.2
Tu.	5	6	13	39	7	6	37	40	2	9	33	17	1	9	55	17	4	10	31	11	6	10	52	11	9	●
W.	6	7	0	40	10	7	22	41	4	10	16	17	7	10	35	17	9	11	14	11	10	11	36	11	11	0.9
Th.	7	7	44	41	3	8	5	40	11	10	56	17	8	11	18	17	5	11	59	11	10	—	—	—	—	1.9
F.	8	8	26	40	3	8	47	39	4	11	40	17	1	—	—	—	0	0	21	11	8	0	43	11	6	2.9
S.	9	9	7	38	4	9	25	37	0	0	3	16	8	0	27	16	3	1	6	11	3	1	29	10	11	3.9
S.	10	9	43	35	9	10	2	34	0	0	50	15	7	1	14	15	1	1	51	10	7	2	14	10	3	4.9
M.	11	10	21	32	5	10	42	30	10	1	39	14	4	2	6	13	9	2	39	9	11	3	5	9	7	5.9
Tu.	12	11	8	29	5	11	41	28	3	2	35	13	2	3	8	12	8	3	33	9	3	4	6	8	11	6.9
W.	13	—	—	—	—	0	20	27	4	3	48	12	3	4	32	12	0	4	45	8	8	5	25	8	6	7.9
Th.	14	1	4	27	2	1	48	27	3	5	17	12	1	5	58	12	2	6	6	8	7	6	45	8	8	8.9
F.	15	2	29	27	9	3	7	28	7	6	35	12	5	7	7	12	9	7	22	8	10	7	55	9	0	9.9
S.	16	3	43	29	6	4	13	30	6	7	35	13	1	7	58	13	6	8	25	9	3	8	51	9	6	10.9
S.	17	4	38	31	7	5	2	32	7	8	18	13	11	8	36	14	3	9	14	9	8	9	35	9	11	11.9
M.	18	5	23	33	6	5	42	34	4	8	52	14	7	9	7	14	11	9	52	10	1	10	7	10	3	12.9
Tu.	19	6	0	34	11	6	18	35	6	9	23	15	2	9	39	15	4	10	21	10	5	10	36	10	7	13.9
W.	20	6	35	35	10	6	51	36	2	9	54	15	6	10	7	15	7	10	50	10	8	11	4	10	9	14.9
Th.	21	7	7	36	6	7	22	36	7	10	21	15	8	10	35	15	9	11	19	10	10	11	35	10	9	15.9
F.	22	7	37	36	7	7	52	36	5	10	50	15	8	11	4	15	7	11	51	10	9	—	—	—	—	16.9
S.	23	8	8	36	2	8	23	35	10	11	20	15	5	11	37	15	3	0	7	10	8	0	24	10	7	17.9
S.	24	8	39	35	5	8	54	34	11	11	56	15	0	—	—	—	0	41	10	6	0	58	10	4	18.9	
M.	25	9	10	34	2	9	27	33	3	0	15	14	9	0	35	14	5	1	16	10	1	1	36	9	11	19.9
Tu.	26	9	44	32	6	10	2	31	8	0	57	14	1	1	20	13	9	1	57	9	9	2	19	9	6	20.9
W.	27	10	22	30	9	10	47	29	10	1	44	13	5	2	11	13	1	2	43	9	4	3	10	9	2	21.9
Th.	28	11	18	29	1	11	55	28	8	2	43	12	9	3	21	12	7	3	41	9	0	4	18	8	10	22.9
F.	29	—	—	—	—	0	36	28	8	4	4	12	6	4	50	12	8	4	59	8	9	5	40	8	10	23.9
S.	30	1	22	29	2	2	3	30	0	5	33	12	11	6	10	13	4	6	20	9	0	6	57	9	4	24.9
S.	31	2	42	31	2	3	19	32	6	6	43	13	10	7	12	14	5	7	30	9	8	8	2	9	11	25.9
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	25	Add.	9	12	46	Add.	17	14	38	Add.	25	15	52	Add.
2	10	44		10	13	1		18	14	49		26	15	58	
3	11	3		11	13	17		19	15	0		27	16	4	
4	11	21		12	13	31		20	15	11		28	16	8	
5	11	38		13	13	46		21	15	20		29	16	12	
6	11	56		14	14	0		22	15	29		30	16	15	
7	12	13		15	14	13		23	15	38		31	16	17	
8	12	29		16	14	26		24	15	45					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.		
F.	1	8m 6	6 25	8 0	7 7	8 2	3 58	6 0	4 31	6 3	0 59	8 4	1 39	8 8												
S.	2	9 2	7 43	8 4	8 12	8 7	5 0	6 7	5 24	6 10	2 15	9 2	2 43	9 7												
Th.	3	9 59	8 37	8 11	9 2	9 3	5 48	7 2	6 12	7 6	3 8	10 1	3 30	10 8												
M.	4	10 55	9 26	9 6	9 48	9 9	6 36	7 10	6 59	8 1	3 52	11 2	4 13	11 7												
Tu.	5	11 50	10 9	9 11	10 31	10 0	7 22	8 4	7 45	8 6	4 36	12 0	4 59	12 3												
W.	6	08 45	10 52	10 0	11 12	10 1	8 6	8 7	8 26	8 8	5 22	12 5	5 43	12 6												
Th.	7	1 41	11 34	10 0	11 56	9 11	8 46	8 7	9 6	8 5	6 4	12 5	6 26	12 2												
F.	8	2 36	—	—	0 19	9 10	9 27	8 2	9 48	7 11	6 48	11 10	7 10	11 6												
S.	9	3 32	0 42	9 9	1 6	9 7	10 9	7 7	10 30	7 3	7 32	11 0	7 52	10 6												
Th.	10	4 28	1 30	9 4	1 55	9 2	10 53	6 11	11 23	6 6	8 15	10 1	8 41	9 6												
M.	11	5 22	2 22	8 11	2 49	8 7	11 57	6 1	—	—	9 10	9 1	9 42	8 8												
Tu.	12	6 15	3 17	8 4	3 49	8 2	0 34	5 9	1 14	5 6	10 17	8 4	10 57	8 1												
W.	13	7 5	4 26	8 0	5 6	7 11	2 0	5 4	2 43	5 4	11 39	7 11	—	—												
Th.	14	7 53	5 47	7 10	6 29	7 9	3 25	5 6	4 1	5 8	0 21	7 11	1 3	8 0												
F.	15	8 38	7 8	7 10	7 41	8 0	4 33	5 10	5 0	6 1	1 41	8 2	2 14	8 3												
S.	16	9 22	8 9	8 2	8 32	8 5	5 23	6 3	5 43	6 5	2 41	8 9	3 3	9 1												
Th.	17	10 4	8 52	8 7	9 11	8 9	6 2	6 7	6 20	6 10	3 22	9 5	3 38	9 9												
M.	18	10 46	9 27	8 11	9 43	9 1	6 38	7 0	6 55	7 2	3 54	10 0	4 9	10 4												
Tu.	19	11 27	9 59	9 2	10 15	9 3	7 12	7 3	7 29	7 4	4 25	10 6	4 42	10 9												
W.	20	morn.	10 30	9 4	10 44	9 4	7 44	7 5	7 57	7 6	4 58	10 11	5 13	11 0												
Th.	21	0 10	10 58	9 4	11 13	9 4	8 11	7 7	8 26	7 7	5 28	11 1	5 43	11 0												
F.	22	0 53	11 28	9 4	11 43	9 3	8 40	7 6	8 54	7 5	5 58	10 11	6 13	10 10												
S.	23	1 39	11 59	9 3	—	—	9 9	7 3	9 24	7 2	6 29	10 8	6 46	10 6												
Th.	24	2 26	0 17	9 2	0 34	9 1	9 40	7 0	9 56	6 10	7 3	10 3	7 20	10 0												
M.	25	3 16	0 52	9 0	1 14	8 11	10 15	6 7	10 35	6 5	7 38	9 8	7 58	9 4												
Tu.	26	4 8	1 37	8 9	2 0	8 8	11 0	6 2	11 31	5 11	8 20	9 1	8 46	8 10												
W.	27	5 2	2 26	8 6	2 53	8 4	—	—	0 6	5 8	9 17	8 7	9 50	8 3												
Th.	28	5 57	3 24	8 3	4 0	8 2	0 45	5 7	1 30	5 6	10 30	8 3	11 12	8 3												
F.	29	6 52	4 40	8 1	5 21	8 1	2 16	5 7	2 59	5 9	11 54	8 4	—	—												
S.	30	7 46	6 3	8 1	6 42	8 3	3 38	6 0	4 11	6 4	0 37	8 6	1 15	8 10												
Th.	31	8 40	7 17	8 5	7 47	8 8	4 38	6 8	5 2	6 11	1 49	9 3	2 19	9 5												

Half Mean Spring Range. } 4ft. 9in.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

D. H. M.				M.D.				M.D.				M.D.				M.D.			
New	5	2	19	Afternoon.	1	17	N. 53	9	17	S. 56	17	7	S. 4	25	20	N. 33			
First Quarter	12	10	2	Morning.	2	14	36	10	20	1	18	2	56	26	21				
Full	20	1	57	Afternoon.	3	10	20	11	20	56	19	1	N. 18	27	20				
Last Quarter	28	8	34	Morning.	4	5	19	12	20	41	20	5	31	28	18				
					5	08.	5	13	19	25	21	9	34	29	16				
					6	5	28	14	17	15	22	13	15	30	12				
In Perigee	5	7	0	Morning.	7	10	27	15	14	22	23	16	26	31	7				
In Apogee	18	10	0	Morning.	8	14	41	16	10	55	24	18	55						

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

OCTOBER, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.																																																																																																																																																																																																																																																												
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																																
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.																																																																																																																																																																																																																																																																				
F.	1	0 11 10 11	0 51 11 4	0 8 9 1	0 51 9 5	0 22 9 10	1 2 10 1	25'2	S.	2	1 27 12 0	1 55 12 8	1 33 9 9	2 9 10 3	1 42 10 6	2 19 11 0	26'2	S.	3	2 22 13 4	2 48 14 1	2 37 10 9	3 5 11 3	2 52 11 6	3 22 12 0	27'2	M.	4	3 12 14 9	3 34 15 3	3 32 11 8	3 56 12 1	3 51 12 6	4 17 12 10	28'2	Tu.	5	3 56 15 10	4 18 16 3	4 19 12 6	4 43 12 9	4 42 13 2	5 6 13 4	●	W.	6	4 40 16 6	5 2 16 8	5 6 12 11	5 29 13 0	5 28 13 6	5 49 13 8	0'9	Th.	7	5 25 16 8	5 47 16 5	5 51 13 0	6 13 12 10	6 11 13 8	6 34 13 7	1'9	F.	8	6 9 16 1	6 31 15 7	6 35 12 8	6 57 12 4	6 56 13 4	7 18 13 2	2'9	S.	9	6 54 15 1	7 15 14 5	7 19 11 11	7 40 11 6	7 39 12 10	7 58 12 6	3'9	S.	10	7 39 13 10	8 4 13 0	8 0 11 2	8 20 10 7	8 18 12 1	8 38 11 7	4'9	M.	11	8 30 12 2	8 57 11 6	8 43 10 2	9 7 9 8	8 59 11 2	9 21 10 8	5'9	Tu.	12	9 27 10 11	10 5 10 6	9 33 9 3	10 6 8 11	9 50 10 3	10 27 9 10	●	W.	13	10 47 10 3	11 33 10 3	10 46 8 9	11 30 8 8	11 6 9 6	11 47 9 4	7'9	Th.	14	— —	0 15 10 4	— —	0 13 8 8	— —	0 26 9 5	8'9	F.	15	0 53 10 7	1 25 11 0	0 53 8 10	1 31 9 1	1 4 9 7	1 39 9 10	9'9	S.	16	1 52 11 5	2 15 11 10	2 4 9 5	2 31 9 8	2 13 10 2	2 43 10 6	10'9	S.	17	2 36 12 4	2 56 12 8	2 53 10 0	3 14 10 4	3 8 10 9	3 31 11 1	11'9	M.	18	3 14 13 0	3 29 13 5	3 33 10 7	3 51 10 10	3 52 11 4	4 11 11 7	12'9	Tu.	19	3 45 13 9	4 2 14 0	4 8 11 0	4 25 11 3	4 30 11 9	4 48 11 11	13'9	W.	20	4 17 14 2	4 31 14 4	4 41 11 4	4 57 11 6	5 4 12 0	5 18 12 1	○	Th.	21	4 46 14 6	5 2 14 6	5 13 11 7	5 29 11 7	5 33 12 2	5 49 12 3	15'9	F.	22	5 18 14 6	5 34 14 5	5 45 11 7	6 0 11 6	6 5 12 3	6 21 12 2	16'9	S.	23	5 50 14 3	6 7 14 0	6 16 11 5	6 33 11 3	6 37 12 1	6 54 12 0	17'9	S.	24	6 24 13 9	6 42 13 6	6 50 11 1	7 7 10 11	7 10 11 11	7 26 11 9	18'9	M.	25	7 1 13 2	7 22 12 9	7 25 10 8	7 43 10 5	7 44 11 7	8 2 11 5	19'9	Tu.	26	7 44 12 4	8 8 11 10	8 2 10 2	8 22 9 11	8 20 11 2	8 39 10 11	20'9	W.	27	8 35 11 5	9 4 11 1	8 46 9 8	9 11 9 5	9 1 10 8	9 28 10 5	21'9	Th.	28	9 39 10 10	10 20 10 9	9 42 9 2	10 19 9 1	10 2 10 2	10 41 10 0	○	F.	29	11 5 10 10	11 49 11 2	11 2 9 2	11 47 9 3	11 21 9 11	— —	23'9	S.	30	— —	0 27 11 7	— —	0 27 9 6	0 1 10 0	0 38 10 4	24'9	S.	31	1 1 12 2	1 30 12 10	1 5 9 11	1 41 10 4	1 14 10 8	1 50 11 1	25'9
Half Mean Spring Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.																																																																																																																																																																																																																																																																				

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	25		9	12	46		17	14	38		25	15	52	
2	10	44		10	13	1		18	14	49		26	15	58	
3	11	3		11	13	17		19	15	0		27	16	4	
4	11	21		12	13	31		20	15	11		28	16	8	
5	11	38		13	13	46		21	15	20		29	16	12	
6	11	56		14	14	0		22	15	29		30	16	15	
7	12	13		15	14	13		23	15	38		31	16	17	
8	12	29		16	14	26		24	15	45					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9m34	1	8	17	2	1	33	18	1	2	49	13	9
Tu.	2	10 28	1	57	18	11	2	19	19	9	3	46	14	10
W.	3	11 23	2	42	20	4	3	5	20	10	4	13	15	11
Th.	4	0a19	3	27	21	0	3	50	21	0	5	3	16	6
F.	5	1 16	4	12	20	11	4	34	20	8	6	12	16	6
S.	6	2 13	4	55	20	3	5	16	19	8	6	53	16	3
S.	7	3 10	5	37	19	1	5	58	18	5	7	33	15	9
M.	8	4 5	6	20	17	6	6	43	16	8	8	13	15	0
Tu.	9	4 58	7	8	15	9	7	34	14	11	8	52	14	1
W.	10	5 48	8	1	14	2	8	30	13	7	9	35	13	2
Th.	11	6 35	9	5	13	2	9	44	13	1	10	31	12	4
F.	12	7 19	10	26	13	1	11	5	13	3	11	43	12	1
S.	13	8 2	11	42	13	7	—	—	—	—	0	24	11	5
S.	14	8 44	0	15	14	0	0	42	14	6	1	40	12	0
M.	15	9 25	1	7	15	0	1	29	15	7	2	41	12	9
Tu.	16	10 7	1	48	16	2	2	6	16	8	3	30	13	6
W.	17	10 50	2	22	17	2	2	39	17	7	4	13	14	2
Th.	18	11 35	2	56	17	11	3	12	18	2	4	50	14	8
F.	19	morn.	3	29	18	3	3	46	18	5	5	23	15	0
S.	20	0 23	4	3	18	5	4	21	18	4	5	57	15	1
S.	21	1 13	4	38	18	3	4	55	18	1	6	32	15	1
M.	22	2 5	5	12	17	10	5	30	17	7	7	4	14	11
Tu.	23	2 59	5	50	17	4	6	11	16	11	7	39	14	8
W.	24	3 53	6	33	16	6	6	58	16	0	8	17	14	3
Th.	25	4 47	7	24	15	6	7	52	15	1	9	1	13	10
F.	26	5 41	8	23	14	8	8	57	14	6	9	57	13	3
S.	27	6 33	9	36	14	7	10	15	14	9	11	4	13	0
S.	28	7 25	10	55	15	1	11	33	15	6	—	—	—	—
M.	29	8 17	—	—	—	—	0	7	16	1	1	9	12	11
Tu.	30	9 9	0	38	16	9	1	8	17	5	2	23	13	10

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
New- - - -	3	11	35	Afternoon.	1	2	N.24	9	20	S.12	17	8	N.26	25	17	N.	25	17	N.
First Quarter-	11	2	56	Morning.	2	3	S.1	10	18	15	18	12	19	26	13	36	26	13	36
Full - - - -	19	7	18	Morning.	3	8	16	11	15	31	19	15	44	27	9	10	27	9	10
Last Quarter -	26	6	14	Afternoon.	4	12	58	12	12	10	20	18	30	28	4	31	28	4	31
					5	16	48	13	8	22	21	20	24	29	0	S.55	29	0	S.55
In Perigee - -	2	6	0	Afternoon.	6	19	31	14	4	16	22	21	18	30	6		30	6	
In Apogee - -	14	9	0	Afternoon.	7	20	58	15	0	0	23	21	3						
In Perigee - -	30	9	0	Afternoon.	8	21	9	16	4	N.17	24	19	39						

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.						LEITH.						THURSO.						C'S AGE AT NOON.	
		MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.				
		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.			
M.	1	0 44	11	7	1 10	12	2	—	—	0 5	14	11	6 6	11	9	6 28	12	5	26.9		
Tu.	2	1 34	12	8	1 57	13	2	0 29	15	7	0 52	16	3	6 48	13	1	7 7	13	8	27.9	
W.	3	2 19	13	8	2 40	14	0	1 15	16	9	1 37	17	2	7 27	14	2	7 48	14	6	●	
Th.	4	3 2	14	3	3 24	14	5	2 0	17	6	2 22	17	8	8 9	14	7	8 30	14	7	0.5	
F.	5	3 46	14	5	4 8	14	4	2 42	17	8	3 3	17	6	8 52	14	6	9 15	14	3	1.5	
S.	6	4 30	14	1	4 52	13	9	3 25	17	3	3 47	16	11	9 37	13	11	10 0	13	5	2.5	
S.	7	5 15	13	5	5 37	13	0	4 10	16	6	4 32	16	0	10 22	13	0	10 45	12	5	3.5	
M.	8	5 59	12	7	6 22	12	1	4 54	15	7	5 17	15	0	11 9	11	10	11 34	11	3	4.5	
Tu.	9	6 46	11	7	7 12	11	1	5 42	14	5	6 9	13	10	12 0	10	8	—	—	—	5.5	
W.	10	7 41	10	6	8 13	10	0	6 37	13	4	7 8	12	10	0 28	10	2	0 59	9	9	6.5	
Th.	11	8 48	9	8	9 27	9	6	7 42	12	5	8 19	12	2	1 33	9	4	2 11	9	1	7	
F.	12	10 8	9	6	10 46	9	7	9 1	12	1	9 41	12	1	2 55	9	0	3 39	9	0	8.5	
S.	13	11 22	9	9	11 55	10	0	10 15	12	3	10 48	12	6	4 15	9	1	4 49	9	3	9.5	
S.	14	—	—	—	0 25	10	3	11 18	12	10	11 44	13	2	5 20	9	6	5 46	9	10	10.5	
M.	15	0 50	10	6	1 12	10	10	—	—	—	0 6	13	6	6 8	10	3	6 26	10	8	11.5	
Tu.	16	1 31	11	1	1 49	11	5	0 25	13	10	0 43	14	3	6 42	11	1	6 57	11	6	12.5	
W.	17	2 6	11	9	2 22	12	0	1 1	14	8	1 18	15	0	7 11	11	10	7 26	12	3	13.5	
Th.	18	2 38	12	3	2 53	12	5	1 35	15	3	1 51	15	6	7 40	12	6	7 55	12	8	14.5	
F.	19	3 9	12	7	3 25	12	9	2 7	15	8	2 23	15	10	8 11	12	9	8 27	12	10	○	
S.	20	3 42	12	10	3 59	12	10	2 39	15	11	2 54	15	10	8 43	12	10	9 0	12	9	16.5	
S.	21	4 16	12	9	4 34	12	7	3 11	15	9	3 29	15	7	9 18	12	7	9 36	12	5	17.5	
M.	22	4 52	12	5	5 10	12	3	3 46	15	5	4 5	15	3	9 55	12	3	10 15	12	0	18.5	
Tu.	23	5 30	12	1	5 51	11	11	4 25	15	0	4 46	14	10	10 36	11	9	10 59	11	5	19.5	
W.	24	6 13	11	8	6 36	11	5	5 8	14	7	5 32	14	4	11 24	11	1	11 50	10	10	20.5	
Th.	25	7 1	11	2	7 31	10	11	5 58	14	0	6 26	13	8	—	—	—	0 18	10	7	21.5	
F.	26	8 3	10	7	8 38	10	4	6 57	13	5	7 33	13	2	0 49	10	4	1 23	10	1	22.5	
S.	27	9 17	10	3	10 0	10	5	8 11	13	1	8 52	13	1	2 2	10	0	2 45	10	0	23.5	
S.	28	10 37	10	7	11 13	10	10	9 32	13	3	10 7	13	6	3 28	10	2	4 6	10	4	24.5	
M.	29	11 47	11	3	—	—	—	10 40	13	10	11 10	14	3	4 41	10	7	5 12	10	11	25.5	
Tu.	30	0 17	11	7	0 44	11	11	11 39	14	8	—	—	—	5 40	11	5	6 6	11	11	26.5	
Half Mean Spring } Range.		6ft. 8in.						8ft. 2in.						6ft. 7in.							

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	19		9	16	1		17	14	50		25	12	46	
2	16	19		10	15	55		18	14	37		26	12	27	
3	16	19		11	15	48		19	14	24		27	12	7	
4	16	18		12	15	40		20	14	9		28	11	47	
5	16	16		13	15	32		21	13	54		29	11	26	
6	16	14		14	15	23		22	13	38		30	11	4	
7	16	10		15	15	12		23	13	22					
8	16	6		16	15	1		24	13	4					

TIDE TABLES FOR THE

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.											
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.							
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.						
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	
M.	1	9m34	9	21	10	10	9	51	11	2	3	42	19	0	4	11	19	9	0	32	12	9	1	1	13	4				
Tu.	2	10 28	10	18	11	6	10	41	11	9	4	35	20	6	4	58	21	1	1	28	13	10	1	53	14	4				
W.	3	11 23	11	5	12	1	11	28	12	3	5	21	21	8	5	44	22	0	2	17	14	9	2	40	15	1				
Th.	4	0a19	11	51	12	4	—	—	—	—	6	8	22	4	6	31	22	6	3	1	15	4	3	23	15	6				
F.	5	1 16	0	13	12	4	0	35	12	4	6	54	22	7	7	17	22	6	3	45	15	7	4	7	15	7				
S.	6	2 13	0	58	12	3	1	20	12	1	7	39	22	3	8	0	21	11	4	28	15	5	4	49	15	1				
♄.	7	3 10	1	41	11	11	2	3	11	8	8	21	21	5	8	42	20	10	5	11	14	8	5	33	14	2				
M.	8	4 5	2	25	11	4	2	46	11	1	9	4	20	1	9	26	19	4	5	55	13	8	6	19	13	2				
Tu.	9	4 58	3	8	10	10	3	31	10	6	9	49	18	8	10	14	17	11	6	44	12	8	7	10	12	2				
W.	10	5 48	3	54	10	3	4	19	10	0	10	43	17	3	11	16	16	8	7	37	11	8	8	7	11	3				
Th.	11	6 35	4	47	9	9	5	16	9	7	11	52	16	2	—	—	—	—	8	39	10	11	9	15	10	8				
F.	12	7 19	5	51	9	5	6	33	9	5	0	29	15	10	1	6	15	8	9	56	10	6	10	34	10	7				
S.	13	8 2	7	15	9	6	7	52	9	7	1	42	15	9	2	16	16	0	11	9	10	9	11	41	11	0				
♄.	14	8 44	8	27	9	9	8	59	10	0	2	49	16	5	3	20	17	0	—	—	—	—	0	11	11	4				
M.	15	9 25	9	25	10	2	9	50	10	4	3	47	17	6	4	11	17	11	0	37	11	8	1	1	12	0				
Tu.	16	10 7	10	13	10	7	10	32	10	9	4	32	18	4	4	50	18	9	1	22	12	4	1	43	12	6				
W.	17	10 50	10	50	10	11	11	7	11	1	5	7	19	1	5	24	19	5	2	2	12	11	2	20	13	2				
Th.	18	11 35	11	25	11	3	11	42	11	3	5	41	19	9	5	58	19	11	2	37	13	4	2	54	13	6				
F.	19	morn.	11	58	11	4	—	—	—	—	6	15	20	0	6	33	20	2	3	9	13	8	3	25	13	10				
S.	20	0 23	0	15	11	4	0	31	11	4	6	50	20	3	7	7	20	3	3	41	13	11	3	58	14	0				
♄.	21	1 13	0	48	11	4	1	6	11	3	7	25	20	3	7	42	20	2	4	15	14	0	4	32	13	11				
M.	22	2 5	1	23	11	2	1	41	11	1	7	59	20	0	8	17	19	10	4	49	13	9	5	7	13	6				
Tu.	23	2 59	1	59	11	0	2	18	10	10	8	35	19	7	8	56	19	3	5	26	13	3	5	47	13	0				
W.	24	3 53	2	38	10	9	2	59	10	7	9	18	18	10	9	40	18	6	6	9	12	9	6	34	12	6				
Th.	25	4 47	3	21	10	5	3	44	10	3	10	4	18	1	10	32	17	9	7	0	12	3	7	27	12	0				
F.	26	5 41	4	9	10	2	4	38	10	1	11	5	17	5	11	42	17	2	7	57	11	9	8	30	11	7				
S.	27	6 33	5	9	10	0	5	43	9	11	—	—	—	—	0	21	16	11	9	7	11	6	9	47	11	6				
♄.	28	7 25	6	23	10	0	7	5	10	1	0	59	17	0	1	34	17	2	10	25	11	7	11	1	11	10				
M.	29	8 17	7	43	10	3	8	18	10	6	2	8	17	6	2	40	18	2	11	33	12	2	—	—	—	—				
Tu.	30	9 9	8	51	10	9	9	22	11	0	3	12	18	10	3	42	19	5	0	3	12	8	0	32	13	1				
Half Mean Spring Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.											

Phases of the Moon.						Moon's Declination at Noon.												
						M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
New	-	-	-	3	11 35	Afternoon.	1	2	N.24	9	20	S.12	17	8	N.26	25	17	N.7
First Quarter	-	11	2	56	Morning.	2	3	S.1	10	18	15	18	12	19	26	13	36	
Full	-	-	-	19	7 18	Morning.	3	8	16	11	15	31	19	15	44	27	9	16
Last Quarter	-	26	6	14	Afternoon.	4	12	58	12	12	10	20	18	30	28	4	21	
						5	16	48	13	8	22	21	20	24	29	0	S.53	
In Perigee	-	-	2	6	0	Afternoon.	6	19	31	14	4	16	22	21	18	30	6	7
In Apogee	-	14	9	0	Afternoon.	7	20	58	15	0	0	23	21	3				
In Perigee	-	30	9	0	Afternoon.	8	21	9	16	4	N.17	24	19	39				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	D.								
M.	1	0 44	11 7	1 10	12 2	—	—	0 5	14 11	6 6	11 9	6 28	12 5	26.9												
Tu.	2	1 34	12 8	1 57	13 2	0 29	15 7	0 52	16 3	6 48	13 1	7 7	13 8	27.9												
W.	3	2 19	13 8	2 40	14 0	1 15	16 9	1 37	17 2	7 27	14 2	7 48	14 6	●												
Th.	4	3 2	14 3	3 24	14 5	2 0	17 6	2 22	17 8	8 9	14 7	8 30	14 7	0.5												
F.	5	3 46	14 5	4 8	14 4	2 42	17 8	3 3	17 6	8 52	14 6	9 15	14 3	1.5												
S.	6	4 30	14 1	4 52	13 9	3 25	17 3	3 47	16 11	9 37	13 11	10 0	13 5	2.5												
S.	7	5 15	13 5	5 37	13 0	4 10	16 6	4 32	16 0	10 22	13 0	10 45	12 5	3.5												
M.	8	5 59	12 7	6 22	12 1	4 54	15 7	5 17	15 0	11 9	11 10	11 34	11 3	4.5												
Tu.	9	6 46	11 7	7 12	11 1	5 42	14 5	6 9	13 10	12 0	10 8	—	—	5.5												
W.	10	7 41	10 6	8 13	10 0	6 37	13 4	7 8	12 10	0 28	10 2	0 59	9 9	6.5												
Th.	11	8 48	9 8	9 27	9 6	7 42	12 5	8 19	12 2	1 33	9 4	2 11	9 1	7.5												
F.	12	10 8	9 6	10 46	9 7	9 1	12 1	9 41	12 1	2 55	9 0	3 39	9 0	8.5												
S.	13	11 22	9 9	11 55	10 0	10 15	12 3	10 48	12 6	4 15	9 1	4 49	9 3	9.5												
S.	14	—	—	0 25	10 3	11 18	12 10	11 44	13 2	5 20	9 6	5 46	9 10	10.5												
M.	15	0 50	10 6	1 12	10 10	—	—	0 6	13 6	6 8	10 3	6 26	10 8	11.5												
Tu.	16	1 31	11 1	1 49	11 5	0 25	13 10	0 43	14 3	6 42	11 1	6 57	11 6	12.5												
W.	17	2 6	11 9	2 22	12 0	1 1	14 8	1 18	15 0	7 11	11 10	7 26	12 3	13.5												
Th.	18	2 38	12 3	2 53	12 5	1 35	15 3	1 51	15 6	7 40	12 6	7 55	12 8	14.5												
F.	19	3 9	12 7	3 25	12 9	2 7	15 8	2 23	15 10	8 11	12 9	8 27	12 10	15.5												
S.	20	3 42	12 10	3 59	12 10	2 39	15 11	2 54	15 10	8 43	12 10	9 0	12 9	16.5												
S.	21	4 16	12 9	4 34	12 7	3 11	15 9	3 29	15 7	9 18	12 7	9 36	12 5	17.5												
M.	22	4 52	12 5	5 10	12 3	3 46	15 5	4 5	15 3	9 55	12 3	10 15	12 0	18.5												
Tu.	23	5 30	12 1	5 51	11 11	4 25	15 0	4 46	14 10	10 36	11 9	10 59	11 5	19.5												
W.	24	6 13	11 8	6 36	11 5	5 8	14 7	5 32	14 4	11 24	11 1	11 50	10 10	20.5												
Th.	25	7 1	11 2	7 31	10 11	5 58	14 0	6 26	13 8	—	—	0 18	10 7	21.5												
F.	26	8 3	10 7	8 38	10 4	6 57	13 5	7 33	13 2	0 49	10 4	1 23	10 1	22.5												
S.	27	9 17	10 3	10 0	10 5	8 11	13 1	8 52	13 1	2 2	10 0	2 45	10 0	23.5												
S.	28	10 37	10 7	11 13	10 10	9 32	13 3	10 7	13 6	3 28	10 2	4 6														

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	19	Add.	9	16	1	Add.	17	14	50	Add.	25	12	46	Add.
2	16	19		10	15	55		18	14	37		26	12	27	
3	16	19		11	15	48		19	14	24		27	12	7	
4	16	18		12	15	40		20	14	9		28	11	47	
5	16	16		13	15	32		21	13	54		29	11	26	
6	16	14		14	15	23		22	13	38		30	11	4	
7	16	10		15	15	12		23	13	22					
8	16	6		16	15	1		24	13	4					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NO RTH SHIELDS *add 6 m.* LEITH *add 13 m.* THURSO *add 14 m.*

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9 m 34	9 21	9 3	9 48	9 6	8 44	24 2	9 8	25 2	3 17	19 1	3 47	20 0
Tu.	2	10 28	10 13	9 8	10 37	9 10	9 31	26 1	9 53	26 10	4 14	20 10	4 40	21 7
W.	3	11 23	11 2	10 0	11 27	10 2	10 16	27 4	10 39	27 9	5 6	22 1	5 31	22 6
Th.	4	0 a 19	11 51	10 3	—	—	11 2	28 0	11 25	28 2	5 55	22 9	6 17	22 11
F.	5	1 16	0 14	10 4	0 37	10 3	11 48	28 0	—	—	6 39	22 10	7 13	22 7
S.	6	2 13	1 0	10 3	1 22	10 2	0 10	27 9	0 32	27 4	7 22	22 2	7 43	21 7
S.	7	3 10	1 43	10 0	2 3	9 10	0 53	26 8	1 14	25 11	8 5	21 0	8 26	20 3
M.	8	4 5	2 24	9 8	2 46	9 5	1 35	25 0	1 56	24 1	8 48	19 5	9 9	18 8
Tu.	9	4 58	3 8	9 2	3 31	8 11	2 19	23 2	2 42	22 4	9 31	17 10	9 54	17 1
W.	10	5 48	3 55	8 9	4 22	8 7	3 7	21 5	3 35	20 7	10 17	16 4	10 42	15 7
Th.	11	6 35	4 51	8 4	5 25	8 2	4 6	19 11	4 43	19 5	11 11	15 1	11 46	14 10
F.	12	7 19	6 3	8 0	6 41	7 11	5 26	19 3	6 9	19 4	—	—	0 22	14 10
S.	13	8 2	7 18	8 0	7 54	8 2	6 48	19 8	7 23	20 1	1 3	14 11	1 42	15 3
S.	14	8 44	8 27	8 4	8 55	8 6	7 55	20 8	8 22	21 3	2 18	15 9	2 49	16 4
M.	15	9 25	9 20	8 7	9 42	8 9	8 45	21 10	9 5	22 5	3 15	16 11	3 40	17 6
Tu.	16	10 7	10 3	8 11	10 21	9 0	9 23	23 0	9 41	23 6	4 2	18 0	4 23	18 0
W.	17	10 50	10 39	9 1	10 58	9 2	9 57	23 11	10 13	24 3	4 43	19 0	5 2	19 5
Th.	18	11 35	11 16	9 3	11 34	9 4	10 30	24 7	10 47	24 10	5 21	19 8	5 39	19 11
F.	19	morn.	11 52	9 5	—	—	11 4	25 0	11 21	25 2	5 56	20 1	6 12	20 3
S.	20	0 23	0 10	9 6	0 27	9 6	11 38	25 2	11 56	25 2	6 29	20 4	6 47	20 3
S.	21	1 13	0 45	9 6	1 3	9 6	—	—	0 14	25 1	7 4	20 2	7 21	20 0
M.	22	2 5	1 21	9 6	1 38	9 5	0 31	24 11	0 49	24 8	7 39	19 9	7 58	19 6
Tu.	23	2 59	1 57	9 5	2 17	9 4	1 7	24 3	1 26	23 11	8 18	19 3	8 39	18 10
W.	24	3 53	2 37	9 2	2 58	9 1	1 47	23 5	2 9	23 0	9 0	18 5	9 22	18 0
Th.	25	4 47	3 21	9 0	3 47	8 11	2 32	22 6	2 58	22 1	9 46	17 8	10 11	17 3
F.	26	5 41	4 14	8 10	4 44	8 8	3 26	21 7	3 58	21 2	10 38	16 9	11 7	16 5
S.	27	6 33	5 17	8 7	5 55	8 6	4 35	20 11	5 16	20 11	11 39	16 4	—	—
S.	28	7 25	6 32	8 6	7 9	8 7	5 58	21 3	6 39	21 8	0 14	16 6	0 52	16 9
M.	29	8 17	7 45	8 9	8 19	8 11	7 14	22 3	7 47	23 0	1 34	17 3	2 11	17 11
Tu.	30	9 9	8 51	9 2	9 21	9 4	8 16	23 9	8 43	24 6	2 45	18 7	3 17	19 4

Half Mean Spring } 4ft. 10in.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New - - - - -	3	11	35	Afternoon.
First Quarter	11	2	56	Morning.
Full - - - - -	19	7	18	Morning.
Last Quarter -	26	6	14	Afternoon.
<hr/>				
In Perigee - -	2	6	0	Afternoon.
In Apogee - -	14	9	0	Afternoon.
In Perigee - -	30	9	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	2	N.24	9	20	S.12	17	8	N.26	25	17	N.7
2	3	S.1	10	18	15	18	12	19	26	13	36
3	8	16	11	15	31	19	15	44	27	9	16
4	12	58	12	12	10	20	18	30	28	4	21
5	16	48	13	8	22	21	20	24	29	0	S.53
6	19	31	14	4	16	22	21	18	30	6	7
7	20	58	15	0	0	23	21	3	31		
8	21	9	16	4	N.17	24	19	39			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.									
M.	1	3	55	34	0	4	26	35	6	7	40	15	0	8	4	15	7	8	33	10	3	9	1	10	7	26.9
Tu.	2	4	55	36	10	5	21	38	1	8	26	16	1	8	48	16	6	9	26	10	10	9	47	11	2	27.9
W.	3	5	47	39	0	6	13	39	8	9	11	16	10	9	33	17	2	10	8	11	5	10	30	11	7	●
Th.	4	6	37	40	0	7	0	40	3	9	54	17	3	10	15	17	4	10	52	11	8	11	14	11	8	0.5
F.	5	7	22	40	3	7	44	39	10	10	35	17	3	10	56	17	0	11	36	11	7	11	59	11	6	1.5
S.	6	8	5	39	3	8	25	38	5	11	18	16	9	11	41	16	4	—	—	—	—	0	21	11	3	2.5
S.	7	8	45	37	7	9	4	36	6	—	—	—	—	0	4	15	11	0	44	11	0	1	6	10	9	3.5
M.	8	9	23	35	2	9	42	33	10	0	27	15	5	0	51	14	10	1	28	10	6	1	51	10	2	4.5
Tu.	9	10	1	32	6	10	21	31	2	1	16	14	3	1	42	13	9	2	15	9	10	2	41	9	7	5.5
W.	10	10	44	29	11	11	11	28	9	2	9	13	3	2	40	12	10	3	8	9	3	3	38	9	0	6.5
Th.	11	11	45	28	0	—	—	—	—	3	14	12	5	3	52	12	2	4	12	8	9	4	49	8	7	7
F.	12	0	22	27	6	1	1	27	6	4	34	12	1	5	14	12	2	5	26	8	7	6	2	8	8	8.5
S.	13	1	39	27	9	2	16	28	3	5	49	12	4	6	22	12	7	6	36	8	9	7	9	8	11	9.5
S.	14	2	51	28	11	3	23	29	8	6	52	12	11	7	18	13	3	7	40	9	1	8	7	9	4	10.5
M.	15	3	52	30	6	4	18	31	5	7	41	13	6	8	1	13	10	8	32	9	6	8	55	9	8	11.5
Tu.	16	4	42	32	4	5	4	33	1	8	19	14	3	8	36	14	6	9	16	9	10	9	35	10	0	12.5
W.	17	5	24	33	11	5	43	34	6	8	52	14	9	9	8	15	0	9	51	10	2	10	7	10	4	13.5
Th.	18	6	2	35	0	6	20	35	5	9	24	15	2	9	40	15	4	10	22	10	6	10	37	10	7	14.5
F.	19	6	38	35	8	6	56	35	11	9	57	15	5	10	12	15	6	10	53	10	8	11	10	10	9	15.5
S.	20	7	13	36	1	7	31	36	1	10	27	15	6	10	43	15	6	11	26	10	8	11	44	10	8	16.5
S.	21	7	48	36	0	8	4	35	9	10	59	15	5	11	17	15	3	—	—	—	—	0	2	10	7	17.5
M.	22	8	21	35	6	8	39	35	2	11	36	15	1	11	56	14	11	0	20	10	6	0	39	10	5	18.5
Tu.	23	8	57	34	9	9	16	34	2	—	—	—	—	0	18	14	8	0	59	10	3	1	20	10	1	19.5
W.	24	9	35	33	6	9	55	32	10	0	41	14	5	1	5	14	2	1	42	9	11	2	6	9	9	20.5
Th.	25	10	16	32	2	10	38	31	5	1	31	13	10	1	59	13	8	2	31	9	8	2	58	9	6	21.5
F.	26	11	5	30	8	11	37	30	2	2	30	13	4	3	4	13	2	3	28	9	4	4	3	9	2	22.5
S.	27	—	—	—	—	0	14	30	0	3	43	13	1	4	25	13	2	4	41	9	1	5	19	9	1	23.5
S.	28	0	51	30	3	1	30	30	8	5	5	13	4	5	41	13	7	5	55	9	3	6	29	9	5	24.5
M.	29	2	7	31	5	2	43	32	4	6	14	13	11	6	44	14	4	7	1	9	8	7	32	9	11	25.5
Tu.	30	3	19	33	4	3	54	34	5	7	12	14	9	7	39	15	2	8	3	10	2	8	33	10	4	26.5
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	19	Add.	9	16	1	Add.	17	14	50	Add.	25	12	46	Add.
2	16	19		10	15	55		18	14	37		26	12	27	
3	16	19		11	15	48		19	14	24		27	12	7	
4	16	18		12	15	40		20	14	9		28	11	47	
5	16	16		13	15	32		21	13	54		29	11	26	
6	16	14		14	15	23		22	13	38		30	11	4	
7	16	10		15	15	12		23	13	22					
8	16	6		16	15	1		24	13	4					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERBY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9m34	8 14	8 11	8 38	9 3	5 25	7 3	5 48	7 6	2 45	10 2	3 8	10 7
Tu.	2	10 28	9 1	9 6	9 24	9 8	6 12	7 9	6 36	8 0	3 29	11 1	3 50	11 6
W.	3	11 23	9 47	9 10	10 9	9 11	6 59	8 2	7 23	8 4	4 13	11 9	4 36	12 0
Th.	4	0a19	10 31	9 11	10 52	9 11	7 45	8 5	8 5	8 6	4 59	12 2	5 22	12 3
F.	5	1 16	11 13	9 11	11 34	9 10	8 25	8 5	8 46	8 3	5 43	12 2	6 4	11 11
S.	6	2 13	11 56	9 9	—	—	9 6	8 0	9 26	7 9	6 26	11 8	6 48	11 3
S.	7	3 10	0 19	9 7	0 42	9 5	9 46	7 5	10 7	7 2	7 10	10 10	7 31	10 5
M.	8	4 5	1 5	9 3	1 30	9 1	10 30	6 10	10 56	6 6	7 52	9 11	8 16	9 6
Tu.	9	4 58	1 56	8 10	2 23	8 8	11 28	6 2	—	—	8 43	9 1	9 14	8 6
W.	10	5 48	2 51	8 5	3 22	8 3	0 2	5 9	0 41	5 6	9 47	8 5	10 23	8 2
Th.	11	6 35	3 54	8 1	4 30	8 0	1 21	5 5	2 4	5 4	11 1	8 0	11 41	8 0
F.	12	7 19	5 8	7 11	5 44	7 10	2 45	5 5	3 21	5 7	—	—	0 18	8 0
S.	13	8 2	6 20	7 10	6 55	7 11	3 53	5 10	4 21	6 0	0 54	8 1	1 28	8 3
S.	14	8 44	7 26	8 0	7 52	8 2	4 47	6 2	5 8	6 4	1 59	8 6	2 25	8 10
M.	15	9 25	8 15	8 4	8 34	8 7	5 27	6 5	5 45	6 7	2 46	9 1	3 5	9 4
Tu.	16	10 7	8 53	8 9	9 11	8 11	6 3	6 9	6 21	6 11	3 22	9 8	3 38	9 11
W.	17	10 50	9 27	9 0	9 44	9 1	6 38	7 1	6 56	7 2	3 54	10 2	4 10	10 5
Th.	18	11 35	10 0	9 2	10 16	9 3	7 14	7 3	7 31	7 4	4 27	10 7	4 44	10 9
F.	19	morn.	10 33	9 3	10 49	9 3	7 47	7 5	8 2	7 6	5 1	10 10	5 18	10 11
S.	20	0 23	11 5	9 3	11 21	9 3	8 17	7 6	8 33	7 5	5 34	11 0	5 51	10 10
S.	21	1 13	11 38	9 2	11 56	9 2	8 49	7 4	9 5	7 2	6 8	10 9	6 26	10 7
M.	22	2 5	—	—	0 15	9 2	9 22	7 1	9 40	6 11	6 44	10 5	7 3	10 2
Tu.	23	2 59	0 35	9 1	0 56	9 0	9 59	6 9	10 21	6 7	7 23	9 11	7 44	9 8
W.	24	3 53	1 20	8 11	1 46	8 9	10 45	6 5	11 14	6 3	8 7	9 5	8 32	9 2
Th.	25	4 47	2 13	8 8	2 42	8 6	11 48	6 0	—	—	9 2	9 0	9 36	8 10
F.	26	5 41	3 12	8 5	3 45	8 4	0 26	5 10	1 8	5 9	10 13	8 8	10 52	8 5
S.	27	6 33	4 22	8 4	5 0	8 3	1 54	5 9	2 37	5 11	11 34	8 9	—	—
S.	28	7 25	5 36	8 4	6 11	8 4	3 14	6 2	3 45	6 5	0 9	8 10	0 45	9 0
M.	29	8 17	6 46	8 5	7 18	8 7	4 14	6 8	4 39	6 11	1 19	9 3	1 51	9 7
Tu.	30	9 9	7 47	8 9	8 14	9 0	5 2	7 2	5 25	7 4	2 19	9 11	2 45	10 3
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
New	3	11	35	Afternoon.	1	2	N.24	9	20	S.12	17	8	N.26	25	17	N.7			
First Quarter	11	2	56	Morning.	2	3	S.1	10	18	15	18	12	19	26	13	36			
Full	19	7	18	Morning.	3	8	16	11	15	31	19	15	44	27	9	16			
Last Quarter	26	6	14	Afternoon.	4	12	58	12	12	10	20	18	30	28	4	21			
					5	16	48	13	8	22	21	20	24	29	0	S.53			
In Perigee	2	6	0	Afternoon.	6	19	31	14	4	16	22	21	18	30	6	7			
In Apogee	14	9	0	Afternoon.	7	20	58	15	0	0	23	21	3						
In Perigee	30	9	0	Afternoon.	8	21	9	16	4	N.17	24	19	39						

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,— BELFAST subtract 2 m. LONDONDERBY add 4 m. SLIGO BAY add 8 m.

NOVEMBER, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.						QUEENSTOWN.						WATERFORD.						C's AGE AT NOON.												
		MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.															
		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.			D.											
M.	1	1	57	13	5		2	23	14	1		2	13	10	9		2	25	11	7		2	56	12	0	26.9						
Tu.	2	2	48	14	8		3	11	15	2		3	7	11	7		3	31	12	0		3	24	12	5	3	51	12	9	27.9		
W.	3	3	33	15	7		3	56	15	11		3	56	12	3		4	20	12	6		4	17	13	0	4	42	13	2	●		
Th.	4	4	18	16	1		4	40	16	3		4	43	12	8		5	6	12	9		5	5	13	3	5	27	13	4	0.5		
F.	5	5	3	16	2		5	25	16	0		5	29	12	7		5	52	12	6		5	50	13	4	6	12	13	3	1.5		
S.	6	5	47	15	8		6	9	15	3		6	14	12	4		6	35	12	1		6	34	13	1	6	56	12	10	2.5		
S.	7	6	31	14	9		6	53	14	2		6	56	11	9		7	17	11	4		7	17	12	7	7	37	12	3	3.5		
M.	8	7	16	13	7		7	40	13	0		7	38	10	11		7	59	10	7		7	58	11	11	8	18	11	6	4.5		
Tu.	9	8	6	12	3		8	33	11	7		8	21	10	2		8	45	9	9		8	38	11	2	9	0	10	9	5.5		
W.	10	9	1	11	1		9	32	10	8		9	9	9	5		9	36	9	1		9	25	10	5	9	55	10	2	6.5		
Th.	11	10	9	10	4		10	49	10	3		10	9	8	10		10	49	8	9		10	31	9	9	11	8	9	7	7	8.5	
F.	12	11	30	10	4		—	—	—	—		11	27	8	9		—	—	—	—		11	43	9	5	—	—	—	—	—	—	8.5
S.	13	0	6	10	6		0	40	10	10		0	4	8	10		0	40	9	0		0	17	9	7	0	51	9	9	9	9.5	
S.	14	1	10	11	2		1	36	11	6		1	15	9	2		1	45	9	5		1	23	9	11	1	54	10	2	10.5		
M.	15	1	58	11	10		2	19	12	3		2	11	9	8		2	34	9	11		2	22	10	6	2	48	10	9	11.5		
Tu.	16	2	38	12	7		2	56	12	11		2	56	10	3		3	15	10	6		3	11	11	0	3	32	11	3	12.5		
W.	17	3	13	13	3		3	30	13	6		3	33	10	8		3	52	10	11		3	52	11	6	4	12	11	8	13.5		
Th.	18	3	47	13	9		4	3	13	11		4	10	11	1		4	27	11	2		4	31	11	9	4	49	11	10	14.5		
F.	19	4	20	14	1		4	36	14	3		4	44	11	4		5	2	11	5		5	7	11	11	5	23	12	0	15.5		
S.	20	4	53	14	4		5	11	14	3		5	20	11	5		5	38	11	5		5	40	12	1	5	58	12	1	16.5		
S.	21	5	29	14	2		5	47	14	1		5	56	11	4		6	13	11	3		6	16	12	0	6	34	12	0	17.5		
M.	22	6	5	13	11		6	24	13	8		6	31	11	2		6	50	11	0		6	52	11	11	7	11	11	10	18.5		
Tu.	23	6	45	13	5		7	7	13	1		7	10	10	10		7	30	10	8		7	30	11	9	7	50	11	7	19.5		
W.	24	7	31	12	10		7	56	12	6		7	51	10	5		8	13	10	3		8	10	11	5	8	30	11	3	20.5		
Th.	25	8	23	12	1		8	52	11	9		8	36	10	0		9	3	9	10		8	52	11	0	9	17	10	10	21.5		
F.	26	9	24	11	5		10	1	11	4		9	31	9	8		10	2	9	6		9	47	10	8	10	24	10	5	22.5		
S.	27	10	41	11	5		11	20	11	7		10	40	9	6		11	18	9	7		11	1	10	4	11	36	10	4	23.5		
S.	28	11	57	11	10		—	—	—	—		11	55	9	9		—	—	—	—		—	—	—	—	0	9	10	6	24.5		
M.	29	0	31	12	3		1	2	12	9		0	31	10	0		1	7	10	3		0	42	10	9	1	16	11	0	25.5		
Tu.	30	1	30	13	2		1	57	13	8		1	41	10	7		2	13	10	11		1	51	11	4	2	25	11	8	26.5		
		11																														
Half Mean Spring Range.		7ft. 5in.						5ft. 10in.						6ft. 2in.																		

Equation of Time at Noon.

M. D.	M.	S.	Ad d.	M. D.	M.	S.	Ad d.	M. D.	M.	S.	Ad d.	M. D.	M.	S.	Ad d.
1	16	19		9	16	1		17	14	50		25	12	46	
2	16	19		10	15	55		18	14	37		26	12	27	
3	16	19		11	15	48		19	14	24		27	12	7	
4	16	18		12	15	40		20	14	9		28	11	47	
5	16	16		13	15	32		21	13	54		29	11	26	
6	16	14		14	15	23		22	13	38		30	11	4	
7	16	10		15	15	12		23	13	22					
8	16	6		16	15	1		24	13	4					

he times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

DECEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
W.	1	10 3	1 33 18 1	1 57 18 9	3 22 14 10	3 49 15 5	9 27 12 4	9 53 12 7						
Th.	2	10 58	2 21 19 3	2 44 19 8	4 15 15 5	4 40 15 9	10 18 12 10	10 41 13 0						
F.	3	11 55	3 8 19 11	3 31 19 11	5 5 15 10	5 28 16 0	11 4 13 0	11 27 13 1						
S.	4	02 53	3 55 19 10	4 18 19 8	5 51 16 0	6 14 15 11	11 51 13 0	—						
S.	5	1 50	4 39 19 5	5 1 19 0	6 36 15 11	6 55 15 6	0 15 12 11	0 38 12 9						
M.	6	2 46	5 22 18 7	5 43 18 2	7 14 15 7	7 34 14 11	1 0 12 7	1 22 12 5						
Tu.	7	3 38	6 4 17 8	6 26 17 0	7 53 15 0	8 12 14 1	1 43 12 2	2 5 11 11						
W.	8	4 28	6 48 16 4	7 10 15 7	8 31 14 4	8 50 13 3	2 27 11 8	2 49 11 5						
Th.	9	5 14	7 34 15 1	7 59 14 5	9 10 13 6	9 33 12 4	3 10 11 1	3 32 10 13						
F.	10	5 58	8 24 13 11	8 50 13 7	9 57 12 8	10 22 12 8	3 56 10 7	4 20 10 4						
S.	11	6 40	9 21 13 5	9 55 13 4	10 49 12 2	11 20 11 5	4 46 10 1	5 15 9 13						
S.	12	7 21	10 30 13 5	11 6 13 7	11 55 12 0	—	5 47 9 10	6 20 9 9						
M.	13	8 3	11 39 13 9	—	0 31 11 8	1 5 12 5	6 55 9 11	7 27 10 1						
Tu.	14	8 45	0 11 14 1	0 39 14 6	1 38 12 3	2 11 12 11	7 58 10 3	8 29 10 6						
W.	15	9 29	1 5 14 11	1 28 15 5	2 39 13 0	3 5 13 6	8 56 10 10	9 20 11 1						
Th.	16	10 16	1 48 15 11	2 8 16 5	3 29 13 7	3 53 13 11	9 42 11 3	10 3 11 6						
F.	17	11 5	2 27 16 11	2 45 17 4	4 16 14 1	4 37 14 4	10 22 11 8	10 41 11 13						
S.	18	11 58	3 4 17 8	3 23 17 11	4 57 14 7	5 17 14 9	11 0 11 11	11 19 12 1						
S.	19	morn.	3 42 18 2	4 2 18 3	5 37 15 0	5 56 14 10	11 38 12 2	11 58 12 3						
M.	20	0 52	4 22 18 4	4 42 18 5	6 15 15 3	6 36 14 11	—	0 19 12 3						
Tu.	21	1 48	5 1 18 5	5 21 18 4	6 55 15 4	7 13 14 9	0 40 12 3	1 2 12 3						
W.	22	2 43	5 42 18 2	6 4 18 0	7 32 15 3	7 53 14 6	1 23 12 3	1 44 12 3						
Th.	23	3 38	6 27 17 8	6 51 17 3	8 14 15 0	8 36 14 1	2 5 12 1	2 28 12 3						
F.	24	4 31	7 16 16 10	7 43 16 5	8 59 14 7	9 24 13 7	2 52 11 10	3 17 11 7						
S.	25	5 22	8 11 16 0	8 40 15 7	9 51 14 1	10 18 13 1	3 42 11 6	4 9 11 4						
S.	26	6 13	9 9 15 4	9 42 15 3	10 48 13 7	11 20 12 10	4 36 11 1	5 4 10 13						
M.	27	7 3	10 18 15 3	10 55 15 4	11 55 13 4	—	5 36 10 10	6 10 10 9						
Tu.	28	7 55	11 33 15 6	—	0 33 13 1	1 11 13 7	6 45 10 9	7 21 10 13						
W.	29	8 47	0 9 15 10	0 42 16 3	1 48 13 7	2 23 14 0	7 56 11 2	8 32 11 5						
Th.	30	9 42	1 13 16 9	1 41 17 2	2 55 14 1	3 26 14 5	9 4 11 8	9 33 11 1						
F.	31	10 38	2 7 17 7	2 32 18 1	3 54 14 8	4 21 14 10	10 1 12 1	10 28 12 5						

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New - - - -	3	10	41	Morning.
First Quarter	10	11	12	Afternoon.
Full - - - -	18	11	50	Afternoon.
Last Quarter	26	2	33	Morning.
In Apogee - -	12	3	0	Afternoon.
In Perigee - -	27	7	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	11	8	9	13	34	17	17	N.41	25	5	N.42
2	15	16	10	9	51	18	19	57	26	0	57
3	18	32	11	5	48	19	21	13	27	4	53
4	20	36	12	1	33	20	21	20	28	9	57
5	21	23	13	2	N.45	21	20	14	29	13	50
6	20	54	14	7	0	22	17	57	30	17	44
7	19	18	15	11	0	23	14	37	31	19	5
8	16	47	16	14	38	24	10	27			

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required, — for
BREST add 18 m DEVONPORT add 17 m. PORTSMOUTH add 4 m.

DECEMBER, 1869.

MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.																																																																																																																																																																																																																																								
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																												
	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.																																																																																																																																																																																																																																														
1	8 50 18 0	9 16 18 5	10 42 15 6	11 7 15 9	—	—	0 9 19 6	27.5	2	9 42 18 10	10 8 19 1	11 31 16 1	11 55 16 4	0 35 19 11	1 0 20 4	28.5	3	10 33 19 3	10 58 19 3	—	—	0 18 16 6	1 26 20 7	1 50 20 9	2 35 20 9	1.1	4	11 24 19 3	11 49 19 2	0 41 16 7	1 4 16 8	2 11 20 9	2 35 20 9	3 19 20 8	2.1	5	—	—	0 13 19 0	1 27 16 7	1 49 16 5	2 56 20 9	3 19 20 8	2.1	6	0 36 18 9	0 59 18 5	2 10 16 3	2 31 16 0	3 41 20 5	4 4 20 2	3.1	7	1 22 18 1	1 45 17 9	2 52 15 10	3 13 15 6	4 24 20 0	4 44 19 9	4.1	8	2 8 17 3	2 30 16 9	3 34 15 2	3 56 14 9	5 4 19 5	5 27 18 11	5.1	9	2 51 16 3	3 13 15 10	4 18 14 5	4 40 14 1	5 49 18 5	6 12 17 11	6.1	10	3 36 15 4	4 0 14 11	5 4 13 9	5 31 13 5	6 37 17 6	7 0 17 1	7.1	11	4 24 14 6	4 50 14 3	5 59 13 2	6 28 12 11	7 25 16 9	7 55 16 6	8.1	12	5 19 14 1	5 49 14 1	7 0 12 10	7 36 12 10	8 29 16 4	9 5 16 4	9.1	13	6 21 14 3	6 52 14 6	8 12 12 11	8 46 13 1	9 39 16 6	10 10 16 8	10.1	14	7 24 14 10	7 54 15 2	9 18 13 4	9 48 13 7	10 43 16 11	11 14 17 3	11.1	15	8 21 15 7	8 43 15 11	10 16 13 10	10 40 14 1	11 42 17 7	—	—	12.1	16	9 4 16 3	9 25 16 7	11 2 14 4	11 22 14 7	0 7 17 11	0 29 18 3	13.1	17	9 46 16 11	10 6 17 2	11 41 14 10	11 59 15 1	0 48 18 7	1 9 18 11	14.1	18	10 27 17 6	10 47 17 8	—	—	0 18 15 3	1 28 19 2	1 48 19 4	2 26 19 7	16.1	19	11 9 17 10	11 31 18 0	0 37 15 4	0 56 15 6	2 7 19 5	2 26 19 7	17.1	20	11 53 18 1	—	—	1 15 15 8	1 34 15 9	2 46 19 8	3 5 19 9	18.1	21	0 14 18 2	0 36 18 2	1 54 15 9	2 13 15 8	3 23 19 10	3 43 19 10	19.1	22	0 59 18 2	1 22 18 1	2 33 15 8	2 52 15 7	4 3 19 10	4 23 19 9	20.1	23	1 45 18 0	2 8 17 10	3 12 15 6	3 34 15 4	4 45 19 9	5 6 19 8	21.1	24	2 32 17 6	2 57 17 3	3 57 15 2	4 21 14 11	5 29 19 5	5 53 19 1	22.1	25	3 23 16 11	3 50 16 7	4 46 14 8	5 13 14 6	6 19 18 8	6 44 18 4	23.1	26	4 17 16 3	4 42 15 11	5 42 14 3	6 14 14 1	7 12 18 1	7 43 17 9	24.1	27	5 11 15 9	5 41 15 8	6 47 13 11	7 22 13 10	8 17 17 6	8 52 17 5	25.1	28	6 13 15 8	6 47 15 11	8 0 13 11	8 37 14 1	9 27 17 6	10 2 17 9	26.1	29	7 22 16 3	7 57 16 7	9 12 14 4	9 46 14 7	10 36 18 0	11 12 18 4	27.1	30	8 28 17 0	8 57 17 4	10 18 14 10	10 47 15 1	11 45 18 8	—	—	28.1	31	9 25 17 7	9 52 17 11	11 14 15 4	11 40 15 6	0 15 19 0	0 42 19 4	29.1
Half Mean Spring } 9ft. 4in. Range.								8ft. 0in.								10ft. 1½in.																																																																																																																																																																																																																																																	

Equation of Time at Noon.

D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
1	10 41		9	7 20		17	3 32		25	0 26	
2	10 18		10	6 52		18	3 3		26	0 56	
3	9 54		11	6 25		19	2 33		27	1 26	
4	9 30		12	5 57		20	2 3		28	1 55	
5	9 5		13	5 28		21	1 33		29	2 25	
5	8 39		14	5 0		22	1 3		30	2 54	
7	8 13		15	4 31		23	0 33		31	3 23	
8	7 47		16	4 1		24	0 4				

times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

DECEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	10m 3	9 51	11 3	10 18	11 6	4 11	20 0	4 36	20 6	1 2	13 6	1 28	13 16
Th.	2	10 58	10 42	11 8	11 7	11 10	4 59	20 11	5 23	21 3	1 54	14 1	2 19	14 5
F.	3	11 55	11 31	12 0	11 54	12 0	5 47	21 6	6 11	21 6	2 42	14 8	3 4	14 9
S.	4	oa 53	—	—	0 17	11 11	6 35	21 7	6 58	21 7	3 27	14 10	3 50	14 11
5.	5	1 50	0 40	11 11	1 3	11 9	7 21	21 5	7 44	21 2	4 12	14 10	4 33	14 8
M.	6	2 46	1 25	11 7	1 47	11 5	8 5	20 10	8 27	20 6	4 55	14 4	5 17	14 0
Tu.	7	3 38	2 9	11 3	2 30	11 0	8 48	20 0	9 10	19 6	5 38	13 7	6 1	13 3
W.	8	4 28	2 52	10 10	3 14	10 7	9 32	18 10	9 54	18 4	6 25	12 9	6 49	12 5
Th.	9	5 14	3 35	10 5	3 56	10 2	10 17	17 10	10 41	17 4	7 12	12 1	7 36	11 9
F.	10	5 58	4 18	10 0	4 44	9 10	11 11	16 11	11 42	16 6	8 3	11 5	8 30	11 1
S.	11	6 40	5 10	9 8	5 36	9 7	—	—	0 13	16 2	8 59	10 11	9 32	10 10
5.	12	7 21	6 7	9 7	6 43	9 7	0 45	16 0	1 16	15 11	10 6	10 9	10 39	10 9
M.	13	8 3	7 20	9 8	7 54	9 9	1 47	16 0	2 17	16 3	11 11	10 11	11 40	11 1
Tu.	14	8 45	8 24	9 10	8 55	10 0	2 47	16 6	3 16	17 0	—	—	0 8	11 4
W.	15	9 29	9 23	10 2	9 48	10 4	3 44	17 5	4 9	17 10	0 35	11 8	0 59	12 3
Th.	16	10 16	10 11	10 6	10 32	10 8	4 31	18 3	4 50	18 7	1 21	12 3	1 42	12 4
F.	17	11 5	10 52	10 10	11 12	11 0	5 9	18 11	5 27	19 3	2 3	12 9	2 23	13 0
S.	18	11 58	11 31	11 2	11 50	11 3	5 46	19 6	6 6	19 8	2 43	13 2	3 2	13 3
5.	19	morn.	—	—	0 9	11 3	6 26	19 10	6 46	20 0	3 20	13 7	3 38	13 9
M.	20	0 52	0 28	11 3	0 47	11 4	7 6	20 2	7 27	20 3	3 57	13 11	4 17	14 0
Tu.	21	1 48	1 7	11 4	1 28	11 3	7 47	20 3	8 7	20 3	4 36	14 0	4 56	13 11
W.	22	2 43	1 48	11 2	2 9	11 2	8 27	20 3	8 48	20 1	5 17	13 10	5 38	13 8
Th.	23	3 38	2 30	11 1	2 52	10 11	9 10	19 9	9 33	19 6	6 1	13 5	6 25	13 1
F.	24	4 31	3 15	10 10	3 39	10 9	9 57	19 2	10 22	18 10	6 51	13 0	7 18	12 10
S.	25	5 22	4 3	10 7	4 28	10 6	10 50	18 7	11 22	18 3	7 46	12 7	8 15	12 4
5.	26	6 13	4 56	10 5	5 25	10 4	11 57	17 11	—	—	8 46	12 2	9 18	12 0
M.	27	7 3	5 55	10 3	6 28	10 3	0 32	17 5	1 6	17 7	9 53	11 11	10 29	11 11
Tu.	28	5 55	7 7	10 3	7 44	10 4	1 38	17 7	2 10	17 9	11 3	12 0	11 36	12 2
W.	29	8 47	8 20	10 6	8 53	10 8	2 43	18 1	3 15	18 6	—	—	0 7	13 5
Th.	30	9 42	9 25	10 10	9 56	11 0	3 47	19 0	4 16	19 5	0 37	12 9	1 6	13 1
F.	31	10 38	10 25	11 2	10 51	11 3	4 44	19 9	5 9	20 0	1 35	13 4	2 3	13 6
Half Mean Spring Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.			

Phases of the Moon.				Moon's Declination at Noon.											
	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - -	3	10	41 Morning.	1	11	S. 1	9	13	8.34	17	17	N. 41	25	5	N. 41
First Quarter	10	11	12 Afternoon.	2	15	16	10	9	51	18	19	57	26	0	3
Full - - - - -	18	11	50 Afternoon.	3	18	32	11	5	48	19	21	13	27	45	3
Last Quarter -	26	2	33 Morning.	4	20	36	12	1	33	20	21	20	28	9	27
				5	21	23	13	2	N. 45	21	20	14	29	13	10
In Apogee - -	12	3	0 Afternoon.	6	20	54	14	7	0	22	17	57	30	17	24
In Perigee - -	27	7	0 Afternoon.	7	19	18	15	11	0	23	14	37	31	19	1
				8	16	47	16	14	38	24	10	27			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	D.						
N.	1	1	10	12	4	1	34	12	8	0	5	15	2	0	29	15	7	6	28	12	5	6	49	12	11	27.5
Th.	2	1	57	13	0	2	21	13	4	0	53	16	0	1	17	16	5	7	10	13	4	7	30	13	8	28.5
F.	3	2	43	13	7	3	5	13	8	1	40	16	9	2	3	16	10	7	51	13	10	8	13	13	11	●
S.	4	3	27	13	9	3	50	13	9	2	25	16	11	2	47	16	10	8	35	13	10	8	58	13	8	1.1
S.	5	4	13	13	7	4	35	13	4	3	9	16	8	3	31	16	5	9	20	13	5	9	42	13	1	2.1
M.	6	4	58	13	0	5	20	12	9	3	52	16	1	4	14	15	9	10	5	12	9	10	27	12	4	3.1
Tu.	7	5	42	12	5	6	5	12	1	4	37	15	5	5	0	15	1	10	50	11	11	11	14	11	5	4.1
W.	8	6	28	11	9	6	51	11	4	5	23	14	8	5	47	14	3	11	38	11	0	—	—	—	—	5.1
Th.	9	7	14	11	0	7	40	10	7	6	11	13	9	6	36	13	4	0	2	10	7	0	28	10	3	6.1
F.	10	8	9	10	2	8	39	9	11	7	4	13	0	7	33	12	8	0	55	9	10	1	23	9	7	7
S.	11	9	10	9	9	9	45	9	8	8	3	12	5	8	37	12	4	1	54	9	5	2	29	9	3	8.1
S.	12	10	18	9	8	10	51	9	9	9	12	12	3	9	46	12	4	3	6	9	2	3	43	9	2	9.1
M.	13	11	23	9	11	11	53	10	1	10	17	12	6	10	47	12	8	4	17	9	3	4	48	9	4	10.1
Tu.	14	—	—	—	—	0	22	10	4	11	15	12	11	11	42	13	2	5	17	9	6	5	44	9	10	11.1
W.	15	0	48	10	7	1	11	10	10	—	—	—	—	0	5	13	6	6	7	10	2	6	26	10	6	12.1
Th.	16	1	31	11	1	1	50	11	4	0	25	13	9	0	44	14	1	6	44	10	11	7	1	11	4	13.1
F.	17	2	9	11	7	2	27	11	10	1	3	14	6	1	22	14	10	7	17	11	8	7	33	12	0	14.1
S.	18	2	44	12	1	3	2	12	3	1	41	15	1	1	59	15	4	7	49	12	4	8	7	12	6	○
S.																										

M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Sub.
1	10	41		9	7	20		17	3	32		25	0	26	
2	10	18		10	6	52		18	3	3		26	0	56	
3	9	54		11	6	25		19	2	33		27	1	26	
4	9	30		12	5	57		20	2	3		28	1	55	
5	9	5		13	5	28		21	1	33		29	2	25	
6	8	39		14	5	0		22	1	3		30	2	54	
7	8	13		15	4	31		23	0	33		31	3	23	
8	7	47		16	4	1		24	0	4					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

NORTH SHIELDS add 6 m.	1	LOUTH add 13 m.	1	THURSO add 14 m.
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DECEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	10m 3	9 48	9 6	10 13	9 8	9 9	25 2	9 33	25 9	3 46	20 0	4 14	20 1	5 9	21 1	5 58	21 7	6 44	21 9	7 27	20 11	8 10	20 6	8 54	18 11
Th.	2	10 58	10 39	9 9	11 5	9 10	9 56	26 3	10 19	26 6	4 42	21 1	5 9	21 1	5 58	21 7	6 44	21 9	7 27	20 11	8 10	20 6	8 54	18 11	9 37	17 4
F.	3	11 55	11 29	9 10	11 54	9 11	10 42	26 8	11 6	26 10	5 34	21 7	6 44	21 9	7 27	20 11	8 10	20 6	8 54	18 11	9 37	17 4	10 16	16 2	11 11	15 1
S.	4	0a 53	—	—	0 18	9 11	11 30	26 10	11 53	26 8	6 21	21 9	7 27	20 11	8 10	20 6	8 54	18 11	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1
S.	5	1 50	0 42	9 11	1 5	9 10	—	—	0 15	26 5	7 6	21 4	7 27	20 11	8 10	20 6	8 54	18 11	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1
M.	6	2 46	1 27	9 9	1 48	9 8	0 37	26 0	0 58	25 6	7 49	20 6	8 10	20 6	8 54	18 11	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2
Tu.	7	3 38	2 9	9 7	2 30	9 5	1 19	24 10	1 40	24 3	8 32	19 6	8 54	18 11	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4
W.	8	4 28	2 52	9 3	3 13	9 1	2 2	23 6	2 23	22 10	9 15	18 3	9 34	17 4	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1
Th.	9	5 14	3 34	8 11	3 56	8 9	2 44	22 2	3 7	21 6	9 54	17 2	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1	16 2	19 1
F.	10	5 58	4 20	8 7	4 44	8 6	3 32	20 10	3 58	20 4	10 38	16 1	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1	16 2	19 1	17 4	20 1
S.	11	6 40	5 11	8 4	5 41	8 3	4 27	19 11	5 1	19 8	11 27	15 3	11 56	15 3	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1	16 2	19 1	17 4	20 1
S.	12	7 21	6 13	8 2	6 46	8 1	5 37	19 7	6 14	19 9	—	—	0 27	15 3	1 38	15 3	2 44	16 4	3 37	17 4	4 23	18 1	5 7	19 1	6 29	20 1
M.	13	8 3	7 20	8 1	7 52	8 2	6 49	20 0	7 20	20 3	1 3	15 3	1 38	15 3	2 44	16 4	3 37	17 4	4 23	18 1	5 7	19 1	6 29	20 1	7 8	20 1
Tu.	14	8 45	8 23	8 4	8 51	8 6	7 50	20 9	8 20	21 3	2 12	15 10	2 44	16 4	3 37	17 4	4 23	18 1	5 7	19 1	6 29	20 1	7 8	20 1	8 32	19 1
W.	15	9 29	9 18	8 7	9 41	8 9	8 43	21 9	9 4	22 3	3 12	16 10	3 37	17 4	4 23	18 1	5 7	19 1	6 29	20 1	7 8	20 1	8 32	19 1	9 37	17 4
Th.	16	10 16	10 2	8 10	10 23	8 11	9 24	22 9	9 43	23 3	4 1	17 10	4 23	18 1	5 7	19 1	6 29	20 1	7 8	20 1	8 32	19 1	9 37	17 4	10 16	16 2
F.	17	11 5	10 43	9 0	11 4	9 1	10 1	23 8	10 19	24 0	4 45	18 9	5 7	19 1	6 29	20 1	7 8	20 1	8 32	19 1	9 37	17 4	10 16	16 2	11 11	15 1
S.	18	11 58	11 25	9 2	11 45	9 3	10 38	24 3	10 57	24 7	5 28	19 5	5 49	19 1	6 29	20 1	7 8	20 1	8 32	19 1	9 37	17 4	10 16	16 2	11 11	15 1
S.	19	morn.	—	—	0 5	9 4	11 17	24 10	11 37	25 1	6 9	19 11	6 29	20 1	7 8	20 1	8 32	19 1	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1
M.	20	0 52	0 26	9 5	0 47	9 6	11 58	25 2	—	—	6 49	20 4	7 8	20 1	8 32	19 1	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2
Tu.	21	1 48	1 7	9 7	1 28	9 7	0 18	25 3	0 39	25 3	7 28	20 4	7 49	20 6	8 54	18 11	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1	14 1	17 4
W.	22	2 43	1 48	9 7	2 9	9 7	0 59	25 2	1 20	24 11	8 10	20 1	8 32	19 1	9 37	17 4	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2	15 1	18 1
Th.	23	3 38	2 31	9 6	2 53	9 5	1 41	24 7	2 3	24 3	8 55	19 7	9 18	19 1	10 16	16 2	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4	16 2	19 1
F.	24	4 31	3 16	9 4	3 40	9 3	2 26	23 10	2 50	23 6	9 41	18 10	10 4	18 1	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1	17 4	20 1
S.	25	5 22	4 5	9 2	4 32	9 1	3 16	23 1	3 43	22 7	10 29	18 2	10 54	17 4	11 11	15 1	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1	16 2	19 1
S.	26	6 13	5 0	9 0	5 29	8 10	4 14	22 2	4 46	21 10	11 18	17 3	11 47	17 4	12 2	14 1	13 3	16 2	14 1	17 4	15 1	18 1	16 2	19 1	17 4	20 1
M.	27	7 3	6 2	8 9	6 36	8 8	5 22	21 9	6 0	21 9	—	—	0 18	17 4	1 32	17 4	2 47	18 1	3 52	19 1	4 51	19 1	5 50	19 1	6 49	20 1
Tu.	28	7 55	7 11	8 8	7 46	8 9	6 39	21 11	7 16	22 3	0 52	17 1	1 32	17 4	2 47	18 1	3 52	19 1	4 51	19 1	5 50	19 1	6 49	20 1	7 48	20 1
W.	29	8 47	8 21	8 10	8 54	9 0	7 49	22 8	8 21	23 2	2 11	17 7	2 47	18 1	3 52	19 1	4 51	19 1	5 50	19 1	6 49	20 1	7 48	20 1	8 47	20 1
Th.	30	9 42	9 26	9 1	9 55	9 3	8 50	23 9	9 17	24 2	3 21	18 7	3 52	19 1	4 51	19 1	5 50	19 1	6 49	20 1	7 48	20 1	8 47	20 1	9 46	20 1
F.	31	10 38	10 22	9 4	10 49	9 5	9 42	24 7	10 6	25 0	4 22	19 6	4 51	19 1	5 50	19 1	6 49	20 1	7 48	20 1	8 47	20 1	9 46	20 1	10 45	20 1

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
New - - - - -	3	10	41	Morning.
First Quarter -	10	11	12	Afternoon.
Full - - - - -	18	11	50	Afternoon.
Last Quarter -	26	2	33	Morning.
In Apogee - -	12	3	0	Afternoon.
In Perigee - -	27	7	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	11	S. 1	9	13	S. 34	17	17	N. 41	25	5	N. 45
2	15	16	10	9	51	18	19	57	26	0	58
3	18	32	11	5	48	19	21	13	27	4	59
4	20	36	12	1	33	20	21	20	28	9	0
5	21	23	13	2	N. 45	21	20	14	29	13	1
6	20	54	14	7	0	22	17	57	30	17	2
7	19	18	15	11	0	23	14	37	31	19	3
8	16	47	16	14	38	24	10	27			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

DECEMBER, 1869.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C'S AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	D.		
W.	1	4 26 35 6	4 55 36 6	8 5 15 7	8 28 15 11	9 1 10 7	9 27 10 9	27.5						
Th.	2	5 23 37 4	5 50 37 11	8 51 16 2	9 14 16 5	9 51 11 0	10 11 11 2	28.5						
F.	3	6 16 38 1	6 41 38 3	9 36 16 6	9 58 16 7	10 33 11 2	10 56 11 3	●						
S.	4	7 5 38 5	7 28 38 3	10 20 16 6	10 41 16 5	11 18 11 3	11 41 11 2	1.1						
S.	5	7 49 37 10	8 10 37 4	11 2 16 2	11 23 15 11	— —	0 4 11 0	2.1						
M.	6	8 30 36 9	8 50 36 0	11 45 15 7	— —	0 26 10 10	0 49 10 8	3.1						
Tu.	7	9 10 35 3	9 30 34 3	0 8 15 3	0 32 14 11	1 11 10 5	1 34 10 2	4.1						
W.	8	9 49 33 3	10 6 32 3	0 57 14 5	1 21 14 0	1 57 9 11	2 20 9 9	5.1						
Th.	9	10 23 31 4	10 43 30 4	1 45 13 8	2 9 13 4	2 43 9 6	3 7 9 4	6.1						
F.	10	11 5 29 6	11 31 28 10	2 36 12 11	3 4 12 8	3 34 9 1	4 3 8 11	7.1						
S.	11	— —	0 1 28 4	3 35 12 5	4 10 12 4	4 33 8 9	5 5 8 8	8.1						
S.	12	0 33 28 0	1 6 28 0	4 45 12 4	5 19 12 5	5 36 8 8	6 7 8 9	9.1						
M.	13	1 41 28 3	2 13 28 6	5 51 12 7	6 21 12 9	6 37 8 10	7 7 9 0	10.1						
Tu.	14	2 45 29 1	3 17 29 9	6 49 13 0	7 16 13 3	7 36 9 2	8 4 9 4	11.1						
W.	15	3 47 30 5	4 15 31 2	7 39 13 6	8 0 13 9	8 30 9 6	8 53 9 7	12.1						
Th.	16	4 40 32 0	5 3 32 9	8 20 14 1	8 39 14 4	9 15 9 9	9 36 9 11	13.1						
F.	17	5 26 33 6	5 48 34 1	8 56 14 7	9 14 14 10	9 55 10 1	10 13 10 3	14.1						
S.	18	6 10 34 7	6 31 35 0	9 33 15 0	9 51 15 2	10 30 10 5	10 48 10 6	○						
S.	19	6 51 35 4	7 12 35 10	10 10 15 4	10 28 15 5	11 7 10 7	11 26 10 8	16.1						
M.	20	7 32 36 2	7 52 36 3	10 46 15 6	11 4 15 6	11 46 10 8	— —	17.1						
Tu.	21	8 12 36 3	8 31 36 2	11 23 15 6	11 45 15 5	0 6 10 8	0 27 10 7	18.1						
W.	22	8 51 36 1	9 12 35 9	— —	0 8 15 4	0 49 10 6	1 11 10 5	19.1						
Th.	23	9 32 35 5	9 52 34 10	0 32 15 2	0 57 14 11	1 34 10 4	1 58 10 2	20.1						
F.	24	10 12 34 2	10 33 33 7	1 23 14 8	1 50 14 5	2 23 10 1	2 49 9 11	21.1						
S.	25	10 56 32 10	11 22 32 1	2 18 14 3	2 47 14 0	3 16 9 10	3 46 9 8	22.1						
S.	26	11 49 31 7	— —	3 20 13 9	3 55 13 7	4 19 9 6	4 52 9 5	23.1						
M.	27	0 22 31 3	0 55 31 1	4 31 13 7	5 8 13 8	5 26 9 4	5 59 9 5	24.1						
Tu.	28	1 30 31 2	2 7 31 5	5 43 13 9	6 16 13 11	6 31 9 6	7 3 9 8	25.1						
W.	29	2 44 31 11	3 21 32 7	6 47 14 2	7 17 14 5	7 35 9 10	8 7 9 11	26.1						
Th.	30	3 58 33 3	4 31 34 0	7 46 14 8	8 13 14 11	8 38 10 1	9 7 10 3	27.1						
F.	31	5 3 34 9	5 33 35 5	8 38 15 2	9 2 15 5	9 35 10 5	0 1 10 6	28.1						
Half Mean Spring Range.		18ft. 7in.				8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Sub.
1	10	41		9	7	20		17	3	32		25	0	26	
2	10	18		10	6	52		18	3	3		26	0	56	
3	9	54		11	6	25		19	2	33		27	1	26	
4	9	30		12	5	57		20	2	3		28	1	55	
5	9	5		13	5	28		21	1	33		29	2	25	
6	8	39		14	5	0		22	1	3		30	2	54	
7	8	13		15	4	31		23	0	33		31	3	23	
8	7	47		16	4	1		24	0	4					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. ! HOLYHEAD add 18 m. ! KINGSTOWN subtract 1 m. for Dublin Time.

DECEMBER, 1869.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	10m 3	8 39	9 3	9 3	9 5	5 49	7 6	6 13	7 8	3 8	10 7	3 30	10 11
Th.	2	10 58	9 27	9 6	9 49	9 8	6 38	7 10	7 2	7 11	3 53	11 3	4 16	11 5
F.	3	11 55	10 12	9 8	10 35	9 8	7 26	8 0	7 49	8 0	4 39	11 7	5 3	11 8
S.	4	02 53	10 57	9 8	11 19	9 7	8 10	8 0	8 31	7 11	5 27	11 8	5 49	11 6
S.	5	1 50	11 40	9 6	—	—	8 51	7 9	9 11	7 7	6 10	11 4	6 32	11 1
M.	6	2 46	0 2	9 5	0 25	9 4	9 32	7 4	9 52	7 1	6 54	10 9	7 15	10 5
Tu.	7	3 38	0 47	9 2	1 11	9 1	10 13	6 11	10 36	6 8	7 37	10 0	7 59	9 8
W.	8	4 28	1 36	8 11	2 1	8 9	11 0	6 4	11 28	6 1	8 22	9 4	8 46	9 0
Th.	9	5 14	2 26	8 7	2 51	8 5	11 58	5 10	—	—	9 12	8 9	9 42	8 6
F.	10	5 58	3 18	8 3	3 46	8 2	0 33	5 7	1 8	5 6	10 13	8 4	10 44	8 2
S.	11	6 40	4 15	8 1	4 46	8 0	1 45	5 5	2 22	5 5	11 18	8 2	11 51	8 2
S.	12	7 21	5 18	8 0	5 50	7 11	2 55	5 7	3 26	5 9	—	—	0 23	8 2
M.	13	8 3	6 22	8 0	6 53	8 0	3 56	5 11	4 22	6 0	0 55	8 3	1 25	8 4
Tu.	14	8 45	7 23	8 1	7 50	8 2	4 46	6 2	5 7	6 4	1 55	8 7	2 22	8 10
W.	15	9 29	8 13	8 4	8 34	8 6	5 27	6 5	5 45	6 7	2 45	9 1	3 5	9 3
Th.	16	10 16	8 53	8 8	9 12	8 10	6 4	6 9	6 23	6 10	3 23	9 6	3 41	9 9
F.	17	11 5	9 31	8 11	9 50	9 0	6 42	7 0	7 2	7 1	3 58	10 0	4 16	10 3
S.	18	11 58	10 9	9 1	10 27	9 2	7 22	7 2	7 41	7 3	4 35	10 5	4 54	10 7
S.	19	morn.	10 46	9 3	11 5	9 3	8 0	7 4	8 19	7 5	5 14	10 9	5 33	10 10
M.	20	0 52	11 24	9 3	11 43	9 3	8 37	7 6	8 55	7 5	5 54	10 11	6 13	10 10
Tu.	21	1 48	—	—	0 3	9 3	9 13	7 4	9 32	7 3	6 32	10 9	6 54	10 8
W.	22	2 43	0 25	9 3	0 47	9 2	9 52	7 2	10 13	7 0	7 15	10 6	7 37	10 3
Th.	23	3 38	1 10	9 2	1 36	9 1	10 36	6 11	11 0	6 9	8 0	10 0	8 24	9 10
F.	24	4 31	2 3	9 0	2 31	8 11	11 32	6 7	—	—	8 50	9 7	9 20	9 7
S.	25	5 22	2 59	8 9	3 29	8 8	0 6	6 4	0 43	6 2	9 53	9 3	10 28	9 1
S.	26	6 13	4 0	8 7	4 32	8 6	1 23	6 1	2 3	6 0	11 3	9 0	11 39	9 1
M.	27	7 3	5 6	8 6	5 40	8 5	2 43	6 2	3 18	6 4	—	—	0 13	9 1
Tu.	28	7 55	6 13	8 5	6 47	8 5	3 48	6 6	4 19	6 8	0 47	9 2	1 21	9 3
W.	29	8 47	7 21	8 6	7 52	8 7	4 44	6 10	5 8	7 0	1 53	9 5	2 24	9 8
Th.	30	9 42	8 20	8 9	8 46	9 0	5 32	7 1	5 57	7 2	2 51	9 11	3 16	10 2
F.	31	10 38	9 12	9 2	9 37	9 3	6 22	7 4	6 48	7 5	3 40	10 5	4 4	10 8

Half Mean Spring } 4ft. 9in.
Range.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	3	10	41	Morning.	1	11	S. 1	9	13	S. 34	17	17	N. 41	25	5	N. 42
First Quarter -	10	11	12	Afternoon.	2	15	16	10	9	51	18	19	57	26	0	36
Full - - - - -	18	11	50	Afternoon.	3	18	32	11	5	48	19	21	13	27	4	S. 32
Last Quarter -	26	2	33	Morning.	4	20	36	12	1	33	20	21	20	28	9	27
					5	21	23	13	2	N. 45	21	20	14	29	13	50
In Apogee - -	12	3	0	Afternoon.	6	20	54	14	7	0	22	17	57	30	17	24
In Perigee - -	27	7	0	Afternoon.	7	19	18	15	11	0	23	14	37	31	19	56
					8	16	47	16	14	38	24	10	27			

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required,—for BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

DECEMBER, 1869.

WEEK DAY.	MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
W.	1	2	23	14	1	2	48	14	6	2	40	11	2	3	7	11	6	2	55	12	0	3	24	12	3	27.5
Th.	2	3	12	14	9	3	35	15	1	3	33	11	9	3	58	11	11	3	52	12	6	4	19	12	8	28.5
F.	3	3	59	15	2	4	22	15	4	4	22	12	0	4	46	12	1	4	45	12	9	5	9	12	9	●
S.	4	4	45	15	4	5	8	15	3	5	11	12	2	5	35	12	1	5	32	12	9	5	55	12	9	1.1
S.	5	5	30	15	1	5	53	14	9	5	57	11	11	6	19	11	9	6	17	12	7	6	40	12	6	2.1
M.	6	6	15	14	5	6	37	14	1	6	40	11	6	7	1	11	3	7	2	12	4	7	23	12	1	3.1
Tu.	7	6	59	13	8	7	22	13	2	7	23	11	0	7	45	10	8	7	43	11	11	8	4	11	8	4.1
W.	8	7	45	12	8	8	8	12	2	8	6	10	5	8	25	10	1	8	24	11	4	8	41	11	1	5.1
Th.	9	8	33	11	8	8	59	11	3	8	46	9	9	9	8	9	6	9	1	10	10	9	23	10	6	6.1
F.	10	9	25	10	11	9	53	10	8	9	31	9	3	9	55	9	1	9	47	10	3	10	16	10	0	7
S.	11	10	26	10	6	11	0	10	6	10	25	9	0	10	58	8	11	10	47	9	10	11	18	9	9	8.1
S.	12	11	35	10	7	—	—	—	—	11	32	8	11	—	—	—	—	11	48	9	8	—	—	—	—	9.1
M.	13	0	8	10	9	0	38	10	11	0	5	9	0	0	37	9	1	0	19	9	9	0	49	9	10	10.1
Tu.	14	1	7	11	2	1	34	11	6	1	9	9	3	1	40	9	6	1	19	10	0	1	49	10	3	11.1
W.	15	1	56	11	10	2	17	12	2	2	8	9	8	2	33	9	11	2	18	10	5	2	45	10	8	12.1
Th.	16	2	38	12	6	2	58	12	9	2	55	10	1	3	17	10	4	3	9	10	11	3	32	11	1	13.1
F.	17	3	17	13	0	3	36	13	3	3	37	10	7	3	57	10	9	3	55	11	4	4	17	11	6	14.1
S.	18	3	55	13	6	4	14	13	9	4	17	10	11	4	37	11	1	4	39	11	8	5	0	11	9	○
S.	19	4	33	14	0	4	52	14	2	4	57	11	3	5	18	11	4	5	20	11	10	5	40	12	1	16.1
M.	20	5	12	14	4	5	32	14	4	5	39	11	5	5	59	11	5	6	0	12	1	6	20	12	1	17.1
Tu.	21	5	53	14	3	6	15	14	2	6	20	11	5	6	41	11	5	6	41	12	2	7	2	12	2	18.1
W.	22	6	37	14	1	6	59	13	11	7	2	11	4	7	24	11	2	7	23	12	1	7	44	12	1	19.1
Th.	23	7	23	13	8	7	48	13	5	7	46	11	0	8	8	10	10	8	5	12	0	8	27	11	10	20.1
F.	24	8	14	13	1	8	41	12	9	8	31	10	8	8	55	10	6	8	49	11	8	9	11	11	6	21.1
S.	25	9	10	12	5	9	40	12	1	9	21	10	3	9	47	10	1	9	35	11	4	10	4	11	1	22.1
S.	26	10	12	11	11	10	47	11	11	10	13	10	0	10	46	9	11	10	34	10	10	11	8	10	9	○
M.	27	11	23	12	0	11	58	12	1	11	21	9	10	11	56	9	11	11	40	10	8	—	—	—	—	24.1
Tu.	28	—	—	—	—	0	32	12	3	—	—	—	—	0	32	10	0	0	12	10	7	0	44	10	9	25.1
W.	29	1	5	12	6	1	35	12	10	1	8	10	2	1	44	10	4	1	17	10	10	1	52	11	1	26.1
Th.	30	2	3	13	2	2	31	13	5	2	17	10	6	2	47	10	9	2	28	11	4	3	1	11	7	27.1
F.	31	2	58	13	8	3	23	13	11	3	16	10	11	3	43	11	2	3	32	11	9	4	2	11	11	28.1
Half Mean Spring } Range.		7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.
1	10	41	Add.	9	7	20	Add.	17	3	32	Add.	25	0	26	Sub.
2	10	18		10	6	52		18	3	3		26	0	56	
3	9	54		11	6	25		19	2	33		27	1	26	
4	9	30		12	5	57		20	2	3		28	1	55	
5	9	5		13	5	28		21	1	33		29	2	25	
6	8	39		14	5	0		22	1	3		30	2	54	
7	8	13		15	4	31		23	0	33		31	3	23	
8	7	47		16	4	1		24	0	4					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6 0	
	Add							Subtract						
Feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	3 0	2 11	2 7	2 1	1 6	0 9	0 0	0 9	1 6	2 1	2 7	2 11	3 0	
4	4 0	3 10	3 6	2 10	2 0	1 0	0 0	1 0	2 0	2 10	3 6	3 10	4 0	
5	5 0	4 10	4 4	3 6	2 6	1 3	0 0	1 3	2 6	3 6	4 4	4 10	5 0	
6	6 0	5 10	5 2	4 3	3 0	1 7	0 0	1 7	3 0	4 3	5 2	5 10	6 0	
7	7 0	6 9	6 1	4 11	3 6	1 10	0 0	1 10	3 6	4 11	6 1	6 9	7 0	
8	8 0	7 9	6 11	5 8	4 0	2 1	0 0	2 1	4 0	5 8	6 11	7 9	8 0	
9	9 0	8 8	7 9	6 4	4 6	2 4	0 0	2 4	4 6	6 4	7 9	8 8	9 0	
10	10 0	9 8	8 8	7 1	5 0	2 7	0 0	2 7	5 0	7 1	8 8	9 8	10 0	
11	11 0	10 8	9 6	7 9	5 6	2 10	0 0	2 10	5 6	7 9	9 6	10 8	11 0	
12	12 0	11 7	10 5	8 6	6 0	3 1	0 0	3 1	6 0	8 6	10 5	11 7	12 0	
13	13 0	12 7	11 3	9 2	6 6	3 4	0 0	3 4	6 6	9 2	11 3	12 7	13 0	
14	14 0	13 6	12 1	9 11	7 0	3 7	0 0	3 7	7 0	9 11	12 1	13 6	14 0	
15	15 0	14 6	13 0	10 7	7 6	3 11	0 0	3 11	7 6	10 7	13 0	14 6	15 0	
16	16 0	15 5	13 10	11 4	8 0	4 2	0 0	4 2	8 0	11 4	13 10	15 5	16 0	
17	17 0	16 5	14 9	12 0	8 6	4 5	0 0	4 5	8 6	12 0	14 9	16 5	17 0	
18	18 0	17 5	15 7	12 9	9 0	4 8	0 0	4 8	9 0	12 9	15 7	17 5	18 0	
19	19 0	18 4	16 5	13 5	9 6	4 11	0 0	4 11	9 6	13 5	16 5	18 4	19 0	
20	20 0	19 4	17 4	14 2	10 0	5 2	0 0	5 2	10 0	14 2	17 4	19 4	20 0	
21	21 0	20 3	18 2	14 10	10 6	5 5	0 0	5 5	10 6	14 10	18 2	20 3	21 0	
22	22 0	21 3	19 1	15 7	11 0	5 8	0 0	5 8	11 0	15 7	19 1	21 3	22 0	
23	23 0	22 3	19 11	16 3	11 6	5 11	0 0	5 11	11 6	16 3	19 11	22 3	23 0	
24	24 0	23 2	20 9	17 0	12 0	6 2	0 0	6 2	12 0	17 0	20 9	23 2	24 0	

RULE—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to, or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 7th, P.M., at 2 h. after high water.

	Ft. in.
Height of high water (by the tables)	19 4
Half mean spring range	13 0
<hr/>	
Height above the half-tide or mean level of the sea	= 6 4

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

Half mean spring range	-	-	-	-	-	13	0
By table (B) 6 ft. 4 in. gives	-	-	-	-	+	3	2
Height of the tide above zero at 2 h. after high water =							16 2

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 29th, P.M., at 4 h. after high water.

						Ft.	in.
Height of high water (by the tables)	-	-	-	-	-	28	8
Half mean spring range	-	-	-	-	-	13	0
Height above the half-tide or mean level of the sea -							15 8
Half mean spring range	-	-	-	-	-	13	0
By table (B) 15 ft. 8 in. gives	-	-	-	-	-	7	10
Height of the tide above zero at 4 h. after high water =							5 2

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 29th, P.M. at 5½ h. after high water.

						Ft.	in.
Height of high water (by the tables)	-	-	-	-	-	28	8
Half mean spring range	-	-	-	-	-	13	0
Height above the half tide or mean level of the sea -							15 8
Half mean spring range	-	-	-	-	-	13	0
By table (B) 15 ft. 8 in. at 5½ h. from high water	-	-	-	-	-	15	1
Level of the tide <i>below</i> zero							2 1

The same rule is applicable for any of the ports the *constants* for which are given at pages 104-108.

Example. Required the height of the tide above zero at Beaumaris on March 7th, P.M., at 2 h. after high water. Liverpool is the standard port for reference, and 4 ft. 7 in. the constant to be applied to the height at Liverpool to find the height at Beaumaris (*see* page 105).

						Ft.	in.
Height of high water at Liverpool (by the tables)	-	-	-	-	-	19	4
Constant for Beaumaris	-	-	-	-	-	4	7
Height of high water at Beaumaris -							14 9
Half mean spring range at Beaumaris (<i>see</i> page 150)	-	-	-	-	-	10	9
Height above the half tide or mean level of the sea							4 0
Half mean spring range	-	-	-	-	-	10	9
By table (B) 4 ft. 0 in. gives	-	-	-	-	+	2	0
Height of the tide above zero at 2 h. after high water =							12 9

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced: for example—The soundings on the chart of Liverpool are reduced to a zero 15 ft. below the mean level of the sea, whereas, the mean spring range for that place, as shown in the result of two years' observations

(1854 and 1855) of the Self-registering Tide Gauge at St. George's Pier, being 26 ft. gives 13 ft. below the mean level of the sea;* consequently 2 ft. will have to be added to the results deduced from table (B.)

Thus, in Example I. On the chart of Liverpool 11 ft. being marked on the bar of the Victoria Channel, the actual depth over the bar at 2h. after high water would be 16 ft. 2 in. + 11 ft. 0 in. + 2 ft. 0 in. = 29 ft. 2 in.

CORRECTIONS FOR CERTAIN DOCKS, &c.†

The depth at high water on the sills of the following Docks may be known, by applying to the standard high water heights given in the foregoing Tables the annexed correction according to the sign.

				Ft.	in.
<i>Falmouth</i>	Over the Sill of Graving Dock No. 1.	-	-	2	0
	Graving Dock No. 2.	-	-	0	0
	(applied to the heights given for Holyhead)				
<i>Devonport</i>	Over the Sill of Basin	-	-	+15	3
<i>H. M. Dockyard.</i>	South Dock	-	-	+12	5
	New Long Dock	-	-	+16	8
	Old North Dock	-	-	+4	11
	New North Dock	-	-	+5	2
„ <i>Keyham</i>	Entrance to Lock	-	-	+18	2
	Entrance to North Basin	-	-	+16	2
	No. 1 Dock	-	-	+8	2
	2 „	-	-	+5	2
	3 „	-	-	+9	2
<i>Plymouth</i>	Great Western Docks, Millbay.				
	Over the Sill of Floating Dock	-	-	+10	3
	Graving Dock	-	-	+11	9
	(applied to the heights given for Devonport.)				
<i>Portsmouth</i>	Over the Sill of No. 1 or South Dock	-	-	+6	8
<i>H. M. Dockyard.</i>	Entrance			+13	4
	No. 2			+10	4
	3	} Basin Dock		+12	5
	4			+13	0
	5			+6	10
	No. 6 or North Dock	-	-	+6	4
	Entrance			+12	2
	No. 7	} Steam Basin		+14	2
	8			+9	1
	9 at N. end of Slips			+8	1
	10 South „	-	-	+14	2
	11 Steam Basin	-	-	+14	2
<i>Portsmouth</i>	Over the Sill of the New Commercial Graving Dock	-	-	+4	10
<i>Sheerness</i>	Over the Invert at the				
<i>H. M. Dockyard.</i>	entrance			+9	8
	Sill of No. 1 Dock	} Great Basin -		+9	2
	2 „			+9	2
	3 „			+9	2
	No. 4 Dock	} Boat Basin -		+3	10
	5 „			-1	4
<i>Chatham</i>	2 „	-	-	-3	11

* The datum mark at Liverpool is the level of the Old Dock Sill. From the two years' observations above alluded to, this datum mark is 5 ft. below the half tide or mean level of the sea, and consequently 8 ft. above the zero of these Tables.

† As it is desirable that the information here given should be accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

			Ft.	in.
<i>H. M. Dockyard</i> —Over the Sill of No. 1 Dock	-	-	+ 3	5
„ 3 „	-	-	+ 3	4
„ 4 „	-	-	+ 0	5
(applied to the Heights given for London.)				
<i>Woolwich</i> —Over the Sill at the entrance of Outer Basin	-	-	+ 2	8
<i>H. M. Dockyard.</i> „ Inner Basin	-	-	+ 0	11
„ No. 1 Dock	-	-	+ 1	11
„ 2 „	-	-	+ 0	11
„ 3 „	-	-	+ 0	11
(applied to the heights given for London.)				
<i>Deptford</i> —Over the Sill of Outer Dock	-	-	- 5	3
<i>H. M. Dockyard.</i> „ Inner Dock	-	-	- 7	3
(applied to the Heights given for London.)				
<i>London</i> —Over the Sill of St. Katherine Dock	-	-	+ 8	2
„ London Dock, Hermitage Entr.	-	-	+ 0	3
„ „ Wapping „	-	-	+ 3	2
„ „ Shadwell, Upper	-	-	+ 5	7
„ „ „ Lower	-	-	+ 8	3
„ Grand Surrey Dock	-	-	+ 7	3
„ New Commercial Dock, Upper	}	-	- 1	10
Entrance		-	-	-
„ Regent's Canal and Dock	-	-	- 1	3
„ New Regent's Dock	-	-	+ 7	8
„ West India Dock, Limehouse	}	+ 3	3	
Entrance		-	-	-
„ City Canal or South West India	}	+ 3	9	
Dock, Limehouse		-	-	-
„ Commercial Dock, Upper, Lime-	}	-	- 1	3
house Reach		-	-	-
„ „ „ Lower „	-	-	+ 7	3
„ City Canal or South West India	}	+ 4	0	
Dock, Blackwall		-	-	-
„ Millwall Dock	-	-	+ 5	8
„ West India Dock, Blackwall	-	-	+ 3	4
„ East India Dock „	-	-	+ 4	9
„ Victoria London Dock „	-	-	+ 8	3
<i>Hull</i> —Over the Sill of Humber Dock	-	-	+ 4	3
<i>Middlesbrough</i> —Over the Sill of the Dock	-	-	+ 4	1
(applied to the Heights given for Sunderland.)				
<i>Hartlepool</i> —Over the Sills of Victoria, West or Coal Dock,	}	+ 6	8	
Swainston and Jackson Docks		-	-	-
(applied to the Heights given for Sunderland.)				
<i>Sunderland</i> —Over the Sill of Wearmouth Dock	-	-	+ 6	0
„ South Dock, North Entrance	-	-	+ 6	0
„ „ South Outlet,	}	+ 8	0	
Inner Gates		-	-	-
„ „ „ Outer „	-	-	+ 10	0
„ Hendon Dock	-	-	+ 12	0
„ No. 1. Graving Dock	-	-	+ 2	0
„ No. 2. „	-	-	+ 2	0
<i>Newcastle-upon-Tyne</i> —Over the Sills of Northumberland	}	+ 9	4	
Dock and Basin		-	-	-
„ Tyne Dock „	-	-	+ 10	1
(applied to the Heights given for North Shields.)				
<i>Leith</i> —Over the Sills of East and West Docks	-	-	+ 0	7
„ Sill of Victoria or New Dock	-	-	+ 6	7
„ Prince of Wales Graving Dock	-	-	+ 5	0
<i>Cardiff</i> —Over the Sill of East Dock	-	-	- 6	2
<i>Bute Docks.</i> „ West Dock	-	-	- 9	2
(applied to the Heights given for Weston-super-mare.)				

		Ft.	in.
<i>Pembroke</i> —Over the Sill of Dock Entrance	- -	+ 3	6
<i>H. M. Dockyard.</i>			
<i>Liverpool</i> —			
Over the Sill of North Carriers Dock, West Passage	-	2	0
„ South „ West Passage	-	2	0
„ Canada Half-tide Dock, W. Entrance	-	0	3
„ Northern West Lock Entrance	-	2	0
„ Southern West Lock Entrance	-	2	0
„ „ North Passage	-	5	0
„ „ South Passage	-	0	3
„ Canada Dock, South Passages, East	-	1	6
„ „ „ West	-	1	6
„ „ Lock	-	0	3
„ Huskisson Dock, East Lock	-	1	6
„ „ West „	-	2	0
„ Sandon Dock, West Entrance	-	1	6
„ Wellington Half-tide Dock, East Entrance	-	1	3
„ „ „ West „	-	1	6
„ Wellington Dock, West Passage	-	1	6
„ Bramley-Moore Dock, North Passage	-	2	0
„ „ South Passage	-	2	0
„ Nelson Dock, South Passage	-	1	6
„ Stanley Dock, West Passage	-	2	4
„ Collingwood Dock, West Passage	-	1	3
„ Salisbury Dock, West Entrances, North	-	1	1
„ „ „ South	-	1	1
„ Clarence Graving Dock Basin, N. Passage	-	3	3
„ „ „ S. Passage	-	3	6
„ Clarence Half-tide Dock, West Entrance	-	3	0
„ „ Dock, West Passage	-	4	10
„ Trafalgar Lock, North and South Passages	-	1	5
„ „ Dock, South Passage	-	3	1
„ Victoria Dock, North Passage	-	3	1
„ „ South Passage	-	1	6
„ Waterloo Dock, Lock, and Entrances	-	0	0
„ Corn Warehouse Dock and Entrances	-	0	0
„ Princes Dock and Locks, North Entrance	-	2	1
„ „ „ South Entrance	-	3	6
„ Georges Dock and Passage, North Entrance	-	3	6
„ „ „ South Passage	-	3	6
„ Manchester Dock, West Entrance	-	8	3
„ „ Lock, West Entrance	-	4	3
„ Canning Dock, West Passage	-	1	11
„ „ Half-tide Basin, two West En- trances, each	-	1	9
„ Albert Dock, North Passage	-	1	8
„ „ East Passage	-	2	0
„ Salthouse Dock, North Passage	-	2	0
„ Wapping Basin, West Passage	-	2	0
„ „ North and South Passages	-	2	0
„ „ Dock, West and South Passages	-	2	0
„ Kings Dock, South Passage	-	3	0
„ Queens Dock Basin, West Entrances, North	-	1	3
„ „ „ South	-	1	3
„ „ West Passage	-	2	0
„ „ South Passage	-	1	6
„ Coburg Dock, West Entrance	-	2	0
„ Brunswick Dock, North Passage	-	1	6
„ „ Half-tide Dock, East Passage	-	2	6
„ „ „ West Entrance	-	2	0

Liverpool—continued :

			Ft.	in.
Over the Sill of	Toxteth Dock, West Entrance	- -	- 3	0
"	Harrington Dock, West Entrance	- -	- 6	10
"	Herculaneum, North Passage	- -	- 0	0
"	" South Passage	- -	- 0	0
"	Garston Dock, North Entrance,	- -	- 2	0
"	River Craft Dock, Lock, and Eagle Basin, } Outer Gates	- -	- 8	3
"	" " " Inner "	- -	- 9	3
"	Duke of Bridgewater's Dock, Outer Gates	- -	- 3	6
"	" " " Middle "	- -	- 8	6
"	" " " Inner "	- -	- 2	0
"	Canada Lock and Graving Dock	- -	- 0	3
"	Huskisson Lock and Graving Dock	- -	- 1	6
"	Sandon Graving Docks, Nos. 1 to 5, East	- -	- 4	6
"	" " No. 6, West	- -	- 4	6
"	Canning Graving Docks, No. 1	- -	- 9	8 $\frac{1}{2}$
"	" " No. 2	- -	- 7	11 $\frac{1}{2}$
"	Queens Graving Docks, No. 1	- -	- 6	3 $\frac{1}{2}$
"	" " No. 2	- -	- 4	6
"	Brunswick Graving Docks, No. 1	- -	- 5	6
"	" " No. 2	- -	- 5	6

Birkenhead—

	Over the Sill of Morpeth Dock Lock, River Entrance,				
		Outer Sill	+	4	0
		Inner Sill	+	4	0
"	" Passage to " Morpeth " Branch Dock	-	+	4	0
"	Sills of Caisson between Egerton Dock and Great				
	Float	-	-	1	0
		East and West Floats	-	0	6
"	" Lock from Low-water Basin into Great Float :				
		Outer Sill	+	4	0
		Inner Sill	+	1	0
"	Alfred Dock, River Entrance	- 100 ft. Lock	+	4	0
		50 ft. do.	+	4	0
		30 ft. do.	+	4	0
"	Passage from Alfred Dock to	{ 100 ft. Lock	+	1	0
	East Float	- 50 ft. do.	+	1	0
		30 ft. do.	+	1	0
"	Graving Dock No. 1.	-	-	0	3
"	" 2.	-	-	0	3
	(applied to the heights given for Liverpool.)				

Dublin—

Over the Sill of	North Wall Graving Dock	-	+ 6	3
"	Old Custom House Dock	-	+ 3	5
"	Georges Dock	-	+ 5	5
"	Camden Lock of Grand Canal Dock	-	+ 7	0
(applied to the heights given for Kingstown.)				

Londonderry—

Over the Sill of	Graving Dock	-	+ 6	9
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TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or - to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

COAST OF IRELAND	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundstone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
" Strangford Quay	+ 1 21	..	"
" Carlingford (Bar) or Cranfield Point	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
St. Ives	— 2 10	..	Weston-super-mare.
Padstow	— 1 41	..	„
Lundy Island	— 1 39	..	„
Barnstaple Bar	— 1 24	..	„
Ilfracombe	— 1 12	..	„
Bridgewater Bar	— 0 4	..	„
Portishead	+ 0 22	..	„
Bristol (King Road)	+ 0 2	..	„
Cardiff	+ 0 5	..	„
Swansea (Mumbles Lighthouse)	— 0 11	..	Pembroke.
Llanelly	+ 0 4	..	„
Tenby	— 0 12	..	„
Milford Haven (entrance)	— 0 20	..	„
Fishguard, Goodic Pier	— 3 15	— 4 5	Holyhead.
Cardigan	— 3 10	..	„
Aberystwyth	— 2 40	— 3 0	„
Aberdovey	— 2 11	..	„
Barmouth	— 2 31	..	„
Pwllheli	— 2 25	..	„
Bardsey Island	— 2 31	..	„
Porth-dyn-lleyn	— 1 41	..	„
Caernarvon	— 0 38	— 2 3	„
Beaumaris	— 0 51	— 4 7	Liverpool.
Port Fleetwood (Wyre Lighthouse)	— 0 12	..	„
Poultoun-le-Sands	+ 0 3	+ 1 3	„
Whitehaven	— 0 9	— 2 9	„
St. Bees Head and Port Har- rington }	— 0 18	..	„
Workington	— 0 19	..	„
Maryport	— 0 20	..	„
Abbey Head	— 0 13	..	„
Southernness	— 0 3	..	„
Annan Foot	+ 0 33	..	„
Port Carlisle	+ 0 47	..	„
Douglas, Isle of Man	+ 1 1	..	Holyhead.
Ramsey „	+ 1 1	+ 3 3	„
Peel „	+ 0 57	+ 0 3	„
Tarn Point, Solway Firth	— 0 1	— 2 11	Liverpool.
Port Patrick	— 0 58	..	Greenock.
Loch Ryan	— 0 56	..	„
Lamlash	— 0 19	..	„
Campbellton	— 0 23	..	„
Ayr	— 0 18	— 1 0	„
Ardrossan	— 0 23	..	„
Largs	— 0 13	..	„
Inverary	— 0 2	..	„
Port Glasgow	+ 0 10	..	„
Glasgow	+ 1 17	..	„
Crinan	+ 4 41	..	„
Tobermory, Isle of Mull	— 2 52	..	Thurso.
Portree, Isle of Skye	— 1 56	..	„
Loch Inver	— 1 47	..	„
Kyle Akin	— 2 12	..	„
Tanera, Summer Isles	— 1 51	..	„
Stornoway, Isle of Lewis	— 1 42	..	„
Cape Wrath	— 0 58	..	„

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Stromness	+ 0 32	..	Thurso.
Lerwick	+ 2 2	..	"
Wick	- 2 55	..	Leith.
Dornock Road	- 2 17	..	"
Cromarty	- 2 21	..	"
Inverness	- 1 59	..	"
Banff	- 1 49	..	"
Peterhead	- 1 43	..	"
Aberdeen	- 1 17	..	"
Stonehaven	- 1 7	..	"
Montrose	- 0 52	..	"
Arbroath	- 0 42	..	"
Tay Bar	- 0 11	..	"
Broughty Ferry	+ 0 5	..	"
Dundee	- 0 50	+ 0 2	Sunderland.
Dunbar	- 1 14	0 0	"
Berwick	- 1 4	..	"
Holy Island	- 0 52	..	"
Blyth	- 0 7	..	"
Tynemouth Bar	- 0 2	..	"
Seaham	+ 0 2	..	"
Hartlepool	+ 0 6	+ 0 8	"
Whitby	+ 0 23	..	"
Scarborough	+ 0 49	+ 1 5	"
Filey Bay	+ 0 58	..	"
Flamborough Head	- 1 59	..	Hull.
Bridlington	- 1 50	..	"
Spurn Point	- 1 3	..	"
Great Grimsby	- 0 53	- 1 8	"
Lynn and Boston Deep	- 0 29	..	"
Wells Bar	- 0 9	..	"
" Harbour	+ 0 31	..	"
Blakeney Bar	+ 0 1	..	"
Yarmouth Road	- 2 51	..	Harwich.
Lowestoft	- 2 9	..	"
Orfordness	- 0 51	..	"
Nore	- 0 7	..	Sheerness.
Chatham	+ 0 34	..	"
Gravesend	- 0 57	..	London.
Woolwich	- 0 28	..	"
Greenwich	- 0 24	..	"
London Docks	- 0 10	+ 0 5	"
Margate	- 2 27	..	"
Ramsgate	- 2 23	- 5 2	"
Deal	+ 0 3	..	Dover.
Folkstone	- 0 5	..	"
Dungeness	- 0 27	..	"
Rye Bay	+ 0 8	..	"
Hastings	- 0 19	..	"
Beachy Head	+ 0 8	..	"
Newhaven	+ 0 39	..	"
Shoreham	+ 0 22	- 1 2	"
Littlehampton	- 0 5	..	Portsmouth.
Selsea Bill	+ 0 4	..	"
Bembridge Point	- 0 41	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Southampton	— 1 11	..	Portsmouth.
West Cowes	— 0 56	..	„
Hurst Camber	— 1 41	..	„
Needles Point	— 1 55	..	„
Christchurch	— 2 41	..	„
Poole	— 2 31	..	„
Portland Breakwater	— 4 40	— 5 10	„
Bridport	+ 0 22	..	Devonport.
Lyme Regis	+ 0 38	..	„
Exmouth	+ 0 38	..	„
Torbay	+ 0 17	..	„
Dartmouth	+ 0 33	..	„
Plymouth Breakwater	— 0 6	..	„
East Looe	— 0 17	..	„
Fowey	— 0 29	..	„
Falmouth	— 0 46	..	„
Penzance	— 1 13	..	„
Scilly Isles (St. Mary)	— 1 16	..	„
WESTERN COAST OF EUROPE.			
Gibraltar	— 1 27	..	Brest.
Cadiz	— 2 2	..	„
Lisbon (Bar)	— 1 17	..	„
Oporto	— 1 17	..	„
Ferrol	— 0 47	..	„
Santander	— 0 17	..	„
Bayonne	— 0 2	..	„
Arcachon	+ 0 50	..	„
Tour de Cordouan	— 0 10	..	„
Bordeaux	+ 3 3	..	„
Ile d'Aix	— 0 27	..	„
Ile d'Yeu	— 0 41	..	„
Ile de Noirmoutier	— 0 45	..	„
Port Navalo	— 0 5	..	„
St. Nazaire	— 0 7	..	„
Belle Ile	— 0 29	..	„
Port Louis	— 0 36	..	„
Port Concarneau	— 0 35	..	„
Ile de Sein	— 0 26	— 1 9	„
Ouessant (Ushant)	— 0 15	— 0 1	„
NORTHERN COAST OF EUROPE.			
Abervrach	+ 0 27	..	Brest.
Morlaix	+ 1 6	..	„
Plougrescan	+ 1 30	..	„
Bréhat	+ 2 4	..	„
St. Malo	+ 2 18	..	„
Granville	+ 2 26	..	„
Ile de Chausey	+ 2 22	..	„
Jersey (St. Helier)	+ 2 38	..	„
Guernsey (St. Peter Port)	+ 2 50	..	„
Ecrehous	+ 2 45	..	„

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	..	Brest.
Cherbourg	+ 4 2	..	„
Barfleur	+ 5 4	..	„
La Hougue	+ 4 55	..	„
Honfleur	+ 5 42	+ 4 3	„
Quillebœuf	+ 6 19	— 9 7	„
Havre	+ 6 4	..	„
Fécamp	+ 6 57	+ 4 2	„
Dieppe	+ 7 19	..	„
Cayeux	+ 7 18	..	„
Boulogne	+ 0 13	..	Dover.
Cape Grisnez	+ 0 15	+ 2 4	„
Calais	+ 0 37	+ 0 10	„
Dunkerque	+ 0 56	..	„
Nieuport	+ 1 6	..	„
Ostend.	+ 1 13	..	„
Flushing	+ 2 8	..	„
Antwerp	+ 5 13	..	„
Hellevoetsluis	+ 3 18	..	„
Rotterdam	+ 4 33	..	„
Helgoland	— 0 33	— 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N.W. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North, till at the last 4½ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At 3¼ hours ebb on the shore it sets W.S.W.; at 4 hours W. by N.; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E.; and then E.N.E and E. by N. till about high water, when its direction is E. by S.

From Bolt Tail to Start Point, at 4 miles off shore, at springs, the eastern stream makes at $2\frac{1}{2}$ hours before high water, and the western stream 3 hours after low water by the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is irregular, varying from 4 to 7 hours after high and low water by the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off the Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about $4\frac{3}{4}$ hours. The direction of the western stream for the first 2 hours is W.S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is E.N.E.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 10h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, or until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

In West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{3}{4}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{3}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour, N.N.E. to E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of the flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S.S.E., 2 knots.

At $2\frac{1}{4}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{4}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E. by N. $\frac{1}{4}$ N., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{3}{4}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W. by S. $\frac{1}{2}$ S., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W. by S. $\frac{1}{4}$ S., $1\frac{3}{4}$ knots. N.B.—About a mile south of the Bill, at half flood, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots. 2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. The 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, about west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 4h. 45m.: the flood and ebb are of equal duration, the former setting S.E., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern or flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{3}{4}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{3}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{3}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W. by S. $\frac{1}{2}$ S. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part, W. $\frac{3}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{4}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high waters occur on either shore of the Solent, as shown in the times of high water at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour, with a rise and fall of 3 or 4 inches for another hour, and only rises and falls 13 inches for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the docks on the same tide.

somewhere near the Light Vessel; for instance, at the 1st hour's flood by the shore it sets East; 2d and 3d hours, E.N.E.; 4th, N.E.; 5th, N.E. by N.; 6th, North; 7th, N.N.W. to N.W.; and the last drain of the flood, N.W. by W. The 1st hour's ebb sets W. by N.; 2d W. by S. to W.S.W.; 3d, S.W. by W. to S.W.; 4th, S.W. $\frac{1}{2}$ S., the first part of the 5th hour, S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2 o'clock, and runs $7\frac{1}{2}$ hours about S.S.E.; and the western stream at 9h. 30m., and runs nearly $4\frac{1}{2}$ hours N.N.W.

Near the Horse Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2 o'clock, $2\frac{1}{2}$ hours after the tide on the shore, and runs to the S.E. $7\frac{1}{2}$ hours; the western stream makes at 9h. 15m., $4\frac{1}{2}$ hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2 o'clock, runs to the S.E. for 2 hours, and then sets east for the remainder of the tide, $5\frac{1}{2}$ hours; the western stream makes at 9h. 45m., and runs W.N.W. $4\frac{1}{2}$ hours.

At Spithead, at full and change, the eastern stream makes about 2 o'clock, $2\frac{1}{2}$ hours after high water in the harbour, and runs 7 hours S.E. by S.; and the western stream about 9 o'clock, $2\frac{1}{2}$ hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about seven hours, and a narrow stream runs in, fifteen or twenty minutes after high water at the Dock-Yard. From the result of three years' observations taken at the Dock-Yard it appears that at high water, slack water at springs continues for eight minutes, and at neaps sixteen minutes.

Looe Stream. At the western entrance near the Pullar Buoy, at full and change, the eastern stream makes at 3h. 45m., and the western stream at 10 hours, and sets S.E. and N.W. Between 2 and 3 miles outside of the Boulder Bank, the stream turns about an hour later; the eastern stream setting E.S.E. and the western stream west. Between the Pullar Bank and the Middle Owers, the eastern stream sets E.S.E. and the western stream west. At the eastern entrance, near Eastborough Head, the eastern stream makes at 4h. 30m., and sets E. by N. $\frac{1}{2}$ N., and the western stream at 9h. 50m. west. Off the west end of the Hooe Bank, the eastern stream makes at 4h. 35m. and sets E.S.E., and the western stream at 10h. 30m. W. $\frac{3}{4}$ N.

About 1 mile S.S.E. of the South Foreland Lighthouse, the stream begins to set to the eastward about 1h. 30m. before high water on the shore at Dover, and runs from N.E. by E. to E.N.E. about $5\frac{1}{2}$ hours, or till 4 hours after high water: it then turns and sets W. by S. $\frac{3}{4}$ S. about 7 hours. At Dover the flowing stream very seldom continues more than 5 hours, and sometimes scarcely so much; it is nearly the same at Ramsgate. To the northward of the South Foreland the streams change their direction to N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S.

In the Downs the north-eastern stream begins about 1h. 20m. before high water at Dover, and continues to run 5h. 30m.: it then turns and runs in a contrary direction till 2 hours before the ensuing high water.*

In the Gull Stream, 1 mile N.N.W. from the Bunthead, the northern stream begins about 1h. 10m. before high water at Dover, and continues for 6 hours: it then turns and runs in a contrary direction till $1\frac{1}{2}$ hours before the ensuing high water. Its direction is N.E. $\frac{3}{4}$ N.; but the last hour changes to E.N.E., and even to the southward of East; the last hour of the southern stream changes from S.W. $\frac{3}{4}$ S. to W.S.W., and even to the northward of West.

* For the tides at the Southsand Head and Northsand Head of the Goodwin, see Compartment VI.

TIDES ON THE EAST COAST OF SCOTLAND AND ENGLAND.

In the North Sea the flood tide-wave enters from the Atlantic Ocean between the coast of Norway and the British Isles, and passes through the various channels formed by the Shetlands, the Orkneys, and the north point of Scotland. The average rate of the stream in the offing is very moderate, not exceeding a knot and a half; but that part of the stream which enters by the Pentland Firth acquires a furious rapidity, amounting at spring tides even to eight knots. Immediately on quitting the Firth, however, it abates in strength, as it diverges into open water; its eastern branch filling up the basin of the North Sea as it advances towards the coast of Jutland and Holland; whilst its western branch, more or less confined by the Dogger and other outlying banks, swells along the shores of Scotland and England, and makes high water in all their rivers and harbours successively till it arrives in the Thames.

The following remarks will assist the seaman in tracing the movement of the tide stream along the coast :—

Off Clythness and Ord Head its rate is about 3 knots at the springs and $1\frac{1}{2}$ with the neaps, and continues to run to the southward till 11 o'clock, or till 3h. 40m. before high water at Leith. Off Covesea Point, Burgh Head, and thence westward towards Fort George and Cromarty, it runs about an hour longer.

Off Cullen the flood stream sets slowly to the eastward, increasing in velocity as it advances: off Troop Head it runs till 1 o'clock, or till 1h. 20m. before high water at Leith; off Kinnaird Head it attains the rate of 2 knots on springs, and is still accelerated as it passes Rattray Brigs till off Peterhead, which is occasioned by the junction of the direct stream from Duncansby Head. Six miles off Kinnaird Head the stream runs to the southward till 2, and at 12 miles till 3 o'clock, or till 40 minutes after high water at Leith.

Off Buchanness the stream attains its greatest strength, namely 4 knots on the springs, and $2\frac{1}{2}$ on the neaps; but off Newburgh it decreases to less than 2 knots, and ceases at 2 o'clock; and at 4 or 5 leagues in the offing it runs till 3 o'clock, or 40 minutes after high water at Leith.

The stream runs past Girdleness till 2h. 30m., or 10m. after high water at Leith; springs at the rate of $2\frac{1}{2}$, neaps $1\frac{1}{2}$ knots. It runs across the mouth of Montrose Harbour and past Red Head till 3 o'clock, or 40 minutes after high water at Leith. From Red Head it sets into St. Andrews Bay till the last quarter, which sets S. and S.S.E.; but to the westward of Red Head it sets W.S.W. past Arbroath and over the Tay Bar.

At 2 miles without the Bell Rock Lighthouse the flood continues running to the southward till 2h. 55m. after high water at Leith; but between the Bell Rock and Fifeness it changes 2 hours earlier. The first part of the latter stream sets towards May Island, the middle to the South, and the last part S.S.E. The first part of the ebb sets from E.N.E. to N.E., the middle N.N.E., and the last part more northerly.

About a mile off St. Abbs Head the flood stream runs to the south-eastward till 2h. 55m. after high water at Leith; but at $5\frac{1}{2}$ or 6 leagues in the offing it continues a quarter of an hour later. About 3 miles off Berwick it runs till 4h. 10m. after high water at Leith.

At 5 miles off North Sunderland Point, and at the same distance south-eastward of the Staples, the flood stream continues till 3h. 25m. after high water at Leith.

About 2 miles off Blyth Harbour, and 4 miles off Tynemouth, it runs to the southward till 3h. 40m. after high water at Leith; and at 4 miles off Sunderland, a quarter of an hour later.

At 3 or 4 miles off Hartlepool, and at the same distance off Whitby, the flood stream runs to the southward till 4h. 10m. after high water at Leith; and at the same distance off Flamborough Head it continues to run half an hour longer.

Near the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 9 o'clock, or three hours after high water on the shore.

Four miles off Cromer, and the same distance off Hasborough, the flood stream runs along shore to the southward till 10h. 15m., or 1h. 45m. before high water at Harwich, and the ebb in a contrary direction.

At 2½ miles off Lowestoft the flood stream continues to run to the S.S.W. till 1h. 30m. before high water at Harwich.

At Orfordness the flood stream continues to run till about high water in Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

At Margate it is high water about 11h. 40m. by the ground. Near the East buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 9h. 15m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, and increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished velocity, till at low water it falls slack at south.

In the River Medway the flood stream runs up in mid-channel from twenty to twenty-five minutes after high water at Sheerness Dock-Yard; but at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the Thames for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the times and the heights of high water. Thus in the North Sea a strong N.N.W. gale and a low barometer raise the surface 2 or 3 feet higher, and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times and heights predicted in the Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Portland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, to the southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed further south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY CAPTAIN F. W. L. THOMAS, R.N.

THE great rapidity of the tidal streams among the Orkneys makes a correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

In the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick smoke; upon the open coast the sea rises at once, and striking upon the rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsá.

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these rippings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

*Depth of the
Tidal Stream.*

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time; the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentland Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick gives 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

*Difference of
Sea-level.*

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appeared that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

*Mean range at
North Isles.*

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

*Semidiurnal
inequality.*

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

South Isles.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

*Set of tide,
Mull of Papa.*

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fail while the flood is running, there would be a great probability of drifting ashore.

*from Mull of
Papa to North
Ronaldsha.*

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

stream off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa and North Ronaldsha 3 knots; but near North Ronaldsha the rate again increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one with a small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa.
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry
Röst.
North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the flood having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2·8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long oval, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed upon a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood tide; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Trevan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely bad *röst* off the Start with southerly winds and flood tide; it stretching 3 or 4 miles to sea, but being heaviest near the shore.

Start of Sanda.

Röst.

Between Westra and Sanda the stream is scarcely sensible, but gathering strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Stronsa Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before is low water on the shore, or $1\frac{3}{4}$ hours before it is low water in the stream, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

**Röst* (pronounced *reust*) a Scandinavian word, meaning a roaring, broken, tidal sea.

the narrows when passing Spur Ness, but it speedily becomes diffused in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.

*Stronsa and
Westra Firths.*

In the Stronsa and Westra Firths, which form one continuous and nearly straight channel, the tide stream is very rapid, as through them and Enhallow Sound the body of the ocean tide is discharged.

North Shoal.

At the North Shoal, which is 15 miles from the entrance of the Firth, the tide sets W. by S. (towards the entrance), and at springs scarcely runs 2 miles an hour; neaps about one.

*Brough of
Birsu.*

Along the coast of West Mainland, or Pomona, the stream is only sensible off the points; but off the Brough of Birsu the flood stream sets to the northward for two hours after it is high water on the shore. when its greatest rate is 2 knots.

*West coast of
Rowsa.*

From the Brough of Birsu the flood sets along shore for Costa and Sacquoy Heads, increasing in velocity as it approaches the Westra Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of Quendale.

Skea Skerries.

The flood stream runs South along the West coast of Westra, from the Noup to the point of Skea, and over the Skea Skerries. Between them and Rowsa the stream acquires great force, even 6 knots, and does not turn for two hours after high water on the shore. Its chief weight passes close round Kili Holm, and crosses for War Ness, (the South Point of Eda,) and the Greenholms.

*Kili Holm.
War Ness.*

Stronsa Firth.

At War Ness the tide stream runs 7 knots, and the röst is quite impassable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in violent commotion, and when bound to Stronsa, a line of breakers may sometimes be seen roaring and foaming within half a cable's length, while vainly looking for a gap or smooth.

The main stream from War Ness, joined by the Stream from Eda Sound, sets past Rousholm Head, and clear of Auskerry to the open sea; and from the Greenholms, past Shapinsha and Deerness, where it is joined by the String, the usual name for the direct run of the stream from Eynhallow Sound by Gairsa, Eller Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Deerness and Auskerry about 4 knots.

*Weatherness
and Fara Ness
Sounds.*

The tides in Weatherness and Fara Ness Sounds are peculiar; the stream turns to the eastward as soon as the tide has ceased to fall upon the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it does in Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets very weakly towards Calf Sound.

*Egilsha and
Shapinsha.*

A very weak stream runs south through Howan Sound during the flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.

Sound.

The flood stream from Costa Head and the reef of Quendale runs towards Eynhallow, and divides there, passing Burgher and the Wael Race at the rate of 7 knots; the streams unite when past the island, but do not average more than 4 knots down Eynhallow Sound.

*Wyre Sound.
Swine Holm.*

A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the latter stream unites with that from the Westra Firth, the rate scarcely equals 2 knots. In the narrow channels among the group of Holms between Gairsa and Shapinsha, the flood sets southerly 6 knots.

*Between Gairsa
and Shapinsha*

*and by Work
Head.*

The main stream from Eynhallow Sound passes S. of Gairsa and thence transversely to Stromberry Head, and on through Shapinsha Sound. The tide stream is narrow in its passage between Work Head and Eller Holm, nor does the *String* expand for some distance after

passing that place; the rate at springs is about 3 knots, and the stream does not turn till $1\frac{1}{4}$ hours after high water on the shore.

The flood-stream running through Hoy Sound commences on the North Side at the Millstone Quarry, 4 miles from Hoy Mouth, and on the South from Hoy Head; the indraught is scarcely felt 5 miles outside the entrance. *Hoy Sound.*

In Hoy Mouth the rate of the stream is 4 knots, until it divides upon Gremsa, when the rate increases to 6 knots; one stream passing through Burwick Sound, the other between Gremsa and Stromness. *Burwick Sound.*

The tide goes over the Skerry Ness, and from thence sets fair for the Skerries of Clestron, where it divides, one stream running up and filling the Bay of Irland, and at half flood setting as a back-tide out of Cairston Road; the other setting rather off shore at first, and then towards Houton Head. From Burwick Sound the stream sets along the shore of Hoy to Green Head, the rate being scarcely 3 knots; and Gremsa causes a large arrear of slack water in the middle of the Sound. *Houton Head.*

After passing Houton Head, the flood stream becomes diffused in Scapa Flow, and is only sensible off that point; its general direction is towards Holm Sound, and at the Barrel of Butter it scarcely runs 2 knots at springs. On the West side of Holm the stream drains along shore to Halcrow Head, where it meets the stream from the Pentland Firth. *Scapa Flow.*

The tide stream runs with greater velocity and turbulence through the Pentland Firth than in any other part of the Orkneys; so that with a strong gale and a weather spring-tide the sea is in many places impassable, and after the wind has gone down, the sea continues to break with great violence for some days, indeed in a sailing ship more danger is to be apprehended from a calm than from a gale of wind. The tide wave from the Atlantic, opposed by the West coast of the Orkneys, is pressed against the shores of Caithness, where at Thurso the tide rises nearly 5 feet higher than at Stromness, though the latter is but 20 miles to the northward. This accumulated mass of water finds egress through the Pentland Firth, where the velocity of the stream near the Little Skerry was said by Captain Otter to have acquired the rate of 10 knots. At the Great and Lothar Skerries, which resist a large body of the tidal stream, the water is sensibly higher by 1 or 2 feet upon the stream side, and a small rapid is formed, of little height indeed, but of great power. Vessels that have drifted upon this rock, when covered by the tide, have been rolled over it, and sunk in deep water on the other side. *Pentland Firth.*

The establishments of the following places in the Pentland Firth were determined by Captain Otter:—

Establishments.

PLACES.	High Water.	Rise above the mean level of L.W. ordinary Springs.		Range, or Rise between L.W. and H.W.		REMARKS.
		Spring.	Neap.	At Springs.	At Neaps.	
Thurso, Scrabster Road -	h. m. 8 28	ft. in. 13 3	ft. in. 9 6	ft. in. 13 3	ft. in. 5 9	Deduced from 4 years' observations.
Duncansby Ness -	10 14	8 6	6 0	8 6	4 0	Mean of 19 comparisons, but very irregular.
Stroma, South Side -	9 47	7 6	6 0	7 6	4 0	Mean of 12 comparisons with Thurso.
Swona, East Side -	10 24	- -	- -	- -	- -	
West Side -	9 35	- -	- -	- -	- -	
Pentland Head, Great Skerry, East Side -	11 4	7 9	6 6	7 9	3 0	Mean of 33 comparisons with Thurso.
Great Skerry, West Side -	10 53	- -	- -	- -	- -	
Widewall -	9 3	- -	- -	- -	- -	Mean of 7 comparisons with Thurso.

The directions as well as the velocities of the tidal streams in the Pentland Firth vary with the hour of the tide; and in almost every case the flood takes a more southerly direction as the tide grows older, and the contrary with the ebb.

Rate.

Direction.

The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching the entrance. Between Turn Ness and Dunnet Head the usual springs rate is 7 knots, but as they round the South end of Swona and North end of Stroma, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore, the flood stream makes strong along the coast of South Walls, and curving to the northward of Swona, washes the Great Lothar, and passes to the northward of the Pentland Skerries.

At a later period of the tide, the stream from Brims Ness goes direct to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she will pass a mile to the southward of Swona, and the same distance to the southward of the Skerries.

Hoxa Sound.

From Cantick Head the flood stream sets past Stangar Head, and crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other runs about 4 knots towards Water and Holm Sounds.

Holm Sound.

Through Holm Sound the rate of the stream is 6 knots where strongest, and it turns at one hour after it is high water on the shore. The rate through Water Sound is 4 knots.

Water Sound.

Cantick Sound.

*East side of
Hoy.*

From Cantick Head a weak stream runs northwards, filling Long Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest part of these Sounds is 2 knots.

*Pentland Firth;
round Swona ;*

Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Swona; but it is almost impossible to predict exactly what direction a drifting vessel would take; with Barth Head open North of Swona, the first quarter flood would send her to the northward of that island, and through the mid-channel between it and South Ronaldsha; but the half flood would probably press her too close to Barth Head, and perhaps on the Great Lothar.

from Widewall.

The first of the flood stream from Widewall sets direct on Barth Head and the Lothar, so that in light winds vessels should in all cases pass as near to the North Head of Swona as possible. As a general rule, if a ship, having left Widewall with light winds and flood tide, should drift nearer to Swona than Barth Head, she will be likely to clear the Lothar—if nearer to Barth Head, she will go too close to that rock.

*Pentland
Skerries.*

When the flood stream first makes at the north head of Swona, it first sets across the channel, but presently turns to the southward, passing clear of the Lothar, and then to the northward of the Pentland Skerries; but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide, sets towards them.

Between the Lothar and the Skerries the flood stream sets fair out to sea, about E.S.E., joining the main stream from Stronsa Firth.

From the South end of Swona the first flood sets right on the Great Skerry, dividing there, and running 7 knots close to the North rocks. On the South side the stream sets off (leaving a narrow eddy inside), at first towards the Little Skerry, but it gradually curves and goes clear of

the Clette. A vessel, however, must be very near the Great Skerry to drift in that direction; if only half way between the Great and Little Skerries she would infallibly drive upon the rocks, where the current runs like a mill-stream. It must be observed, that the general tendency of the flood-stream is to set clear to the westward of the Skerries, and that a vessel must be very near the opening between the Great and Little Skerries before she would feel its indraught. After half tide in the stream, the set of flood from Swona goes well clear to the southward of the Pentland Skerries.

I cannot state with the same personal confidence the direction of the streams of tide on the South side of the Pentland Firth, but the experiments of Capt. Otter show that the flood stream from Dunnet Head and St. Johns Point has a tendency to pass to the northward of Stroma, so that a buoy set adrift within half a mile of Mey Bay will not float through Inner Sound, but rather drift on shore on the west side of Stroma; and from this it would appear that a vessel one mile to the northward of Dunnet Head, with strong flood, will go well clear to the northward of Swona. *Inner Sound.*

The last of the flood stream is pressed down upon Duncansby Head, where it does not cease running till 4 hours ebb on the shore; for which reason, when a vessel is turning up from the southward, she should rather endeavour to enter the Firth upon the North side, when she will usually be able to get as far as Brough Ness while the flood is still running. *Duncansby Head.*

There are large eddies under Stroma and Swona with the flood, and where they meet the main stream little whirlpools are produced, which credulity has exaggerated into objects of importance; on rare occasions they might be dangerous to boats. *Eddies of Swona and Stroma.*

It is almost still water to the eastward of the Skerries during flood, and a large eddy is formed between the Great Lothar and Old Head, commencing at half-flood on the shore; it is called Liddel Eddy, from a farm of that name in South Ronaldsha. *Eddies of Pentland Skerries; and Liddel Eddy.*

Wherever the tide stream is rapid past any point there is always an eddy on the opposite side, and these eddies increase as the tide grows older, till at last only a narrow stream of the former tide is left; this may be well witnessed in Hoy Sound, where the flood stream is sometimes diminished by the encroaching ebb to 20 and 30 feet in breadth.

The indraught of the ebb stream to the Pentland Firth is felt at a considerable distance from the entrance, so that vessels leaving the Mull of Deerness in calm weather are sometimes drifted into the Pentland Firth. From Copinsha the stream runs nine hours to the southward, from half flood on the shore to low water; but its rate is slow, never exceeding 2 knots, except near Old Head, where it runs four. *Ebb stream,*

There is not much danger to be apprehended from the ebb stream in the Pentland Firth when it has made strong; about 3 hours after low water on the shore, it sets fairly through between Duncansby Head and the Skerries, between Swona and Ströma, and over towards Hoy; and a vessel must be far within a line joining Duncansby Head and the North end of Stroma, to feel the indraught of the Inner Sound; for a buoy that has drifted through that Sound with the flood stream will not return with the ebb. *in the Firth.*

Round Brough Ness the ebb pours with great violence, and over the tail of the Great Lothar, where several vessels have thereby been lost. *Great Lothar.*

The stream from the North side of the Pentland Skerry sets upon Swona, dividing upon the South Clette; but the last part of the ebb will go to the northward, between Barth Head and Swona. *Swona.*

From the North Head of Swona the first ebb goes towards Brims Ness, the last towards Switha. There is a very large eddy under Swona *Eddy.*

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and incloses a large eddy ; at half tide these united streams set over toward Turn Ness, where the last of the ebb tide drains, while there is comparatively still water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of the several streams, can learn from the chart.

REMARKS ON THE SET OF THE TIDAL STREAMS IN THE IRISH AND ENGLISH CHANNELS, AND IN THE NORTH SEA.—BY REAR-ADMIRAL F. W. BEECHEY, F.R.S.

*The Common
Standard for
the turn of the
Streams*

A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water along the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard ; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover ; and to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.) ; and it is only necessary to mention here, that to the southward of the parallel of Scilly, the tides of the Channel and offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to make the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of their course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolving motion of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case ; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, yet directly she is loose she will be carried away upon a rhomb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is more regular, and while the water is *falling* at Dover, will be found setting to the *northward* : near the coast partaking of the direction of the shore, and turning sharply round Trevoise Head and Hartland Point into the Bristol

Channel; and while the water is *rising* at Dover, setting as sharply out of the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; and at Trevoise Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; at present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about the parallel of $51^{\circ}00$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versa*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is falling at Liverpool, and *vice versa*. To the westward of this line the tides appear to be slack; but we are in want of further observations in all this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west round Cape Clear, and *vice versa*.

Seven Stones.

Meeting of the
Stream in
 51° N.

Streams between
Scilly and
Tuskar.

Off S. coast of
Ireland.

At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, and N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versa*, as before stated. The *entrance of* Liverpool is properly the standard to which the turn of the stream in these pages is referred, and wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges Pier, to which the tide tables are adapted.

Off the Smalls.

On the Irish side, at the Saltees Lightship, for instance, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{4}$ hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. for the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

Off the Saltees.

From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore
Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE WHEN AT THEIR GREATEST STRENGTH.

Streams turn with the tides of Liverpool and Morecambe Bay.

IN the Irish Channel, as before observed, experiments have shown that, notwithstanding the variety of times of high water throughout the Channel, the turn of the stream over all that part which may be called the fair navigable portion of the Channel is nearly simultaneous; that the northern and southern streams in both Channels commence and end in all parts (practically speaking) at nearly the same time; and that that time happens to correspond nearly with the time of high and low water on the shore at *the entrance* of Liverpool and of Morecambe Bay,* a spot remarkable as being the point where the opposite tides coming round the extremities of Ireland terminate. So that it is necessary only to know the times of high and low water at either of these places, to determine the hour when the stream of either *tide will commence or terminate in any part of the Channel*. For this purpose the Liverpool tide-table may be used, subtracting 18 minutes from the times there given, in consequence of the high water at St. Georges Pier being later than the point which is considered as the head of the tide, and which will be found fully explained at page 125.

Streams enter N. and S. of Ireland.

The tide from the Atlantic enters the Irish Channel by two channels; of which Carnsore Point, the S.E. point of Ireland, and St. Davids Head, the S.W. point of Wales, are the limits of the southern one; and Rathlin and the Mull of Cantyre the boundaries of the northern.

Southern streams from Tuskar to the Isle of Man.

The *central portion of the stream* of flood or *ingoing* stream, runs nearly in a line from a point midway between the Tuskar and the Bishops, to a position 16 miles due west of Holyhead; beyond which it begins to expand eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes to the eastward with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it is arrested by the flood or southern stream from the North Channel coming round the Point of Ayr, and is first turned round to the eastward by it, and then goes on with it at an easy rate direct for Morecambe Bay; thus changing its direction nearly eight points.

Eastern Branch of S. stream sets into Cardigan Bay.

The *outer portions* of the stream are necessarily deflected from the course of the great body of the water by the impediments of banks on the Irish side of the Channel, and by the tortuous form of the coast on the Welsh. The eastern portion passing Linney Head, rushes with great rapidity between the Smalls, Grassholm, and Milford Haven towards the Bishops, which it passes at a rate of between 4 and 5 knots; sets sharply round those rocks in an E.N.E. direction right over the Bass Bank, and into Cardigan Bay; makes the circuit of that Bay, and sets out again towards Bardsey, at the other extremity of it; then sweeping to the N. by W. past the island and through the Sound, it gradually takes the course of the shore, round Caernarvon Bay, filling the Menai Strait as far as Bangor; but the stream still continuing outside towards the South Stack, which it rounds, setting towards the Skerries at a rate of upwards of 4 knots; and, finally, turns sharp round those rocks for

* The entrances of Liverpool and of Morecambe Bay are, as before stated, 18 minutes earlier in their times of high water, than those given for Liverpool in the tide-tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the ebb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

Western Branch sets over the Irish banks.

Off Arklow, no rise or fall.

Codling Bank.

Stream ends off Carlingford. No stream there.

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 20 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

Northern Stream from Rathlin to the Clyde.

The *central portion* midway between the Mull of Galloway and the Copeland Island presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

Central portion of this stream sets to Isle of Man and Morecambe Bay.

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

Western branch of N. stream to Maidens and Belfast.

dangerous group ; and takes the direction of the coast again from Muck Island to Black Head, at the entrance of the Lough of Belfast, which it fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough splits off Grey Point ; one portion flowing up towards Garmoyle, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. Johns Point ; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams. These observations do not, however, extend beyond the points where the Channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left ; that on the north joining the stream from Jura, and turning sharp round Rathlin ; that on the south, speaking now of the outgoing stream, sweeps past St. Davids Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

TABLE SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.

In the following Table, the direction of the stream as it runs at the middle of the tide or at its greatest strength, is given at four places upon lines connecting well known headlands, viz., at 5 miles from the shore, on each side of the channel, and at a third of the distance across the channel from each of those headlands. The names of the places will be found in the marginal columns; and in the adjacent column, a brief description of the course of the streams in the immediate vicinity of each headland. The western part of the stream will be found on the left-hand page, and the eastern half on the right-hand page. *Explanation.*

To use the table, take the line nearest to your position, and at the distance across the Channel which answers best to your distance from the land, take out the direction of the stream from its column; or if the place of the ship falls between two divisions, take the mean of the two directions given in the columns for the direction of the stream at that time. To know when the stream will turn, look in the Tide Tables for the time of high water at Liverpool, for the day, and about 15 minutes after that time the stream will begin to *set out* in both the North and the South Channels, and will run in that direction until about 45 minutes before low water, when the general slack water begins. The slack water in the offing is usually spread over an interval of an hour—from the cessation of one stream to the beginning of the next.

In these tables { F stands for *flood* or *rising* tide at Liverpool.
E stands for *ebb* or *falling* tide at Liverpool.

As a rough general rule, in the fair way of the Channel a vessel will be carried 9 miles by the stream in a whole tide at springs, and at neaps about 6 miles; but near to the land on either side, or to the banks, the rate of the stream greatly increases.

The rates given in the table which follows are at spring tides; and in order to adapt them to neaps, one third may be subtracted from them.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	1/2 over.		
On a line joining the Tuskar and St. Davids Head.	The stream curves with the land and slacks in shore 1 1/2 hours before the offing, and inside the Long Bank 2 1/2 hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. 1/2 E. S.W. 1/2 W.	Rate. 3 3	N. E. by E. S. W. by W.	Rate. 2 1/2 2 1/2 F E
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. 3/4 N. S.S.W. 3/4 W.	3.6 3.6	N.E. 1/2 N. S.W. 3/4 S.	3 1/2 3 1/2 F E
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns 1 1/2 hours before the offing, and 2 hours close in shore.	Kish Light Ship.	N. by E. 3/4 E. S.S.W.	2.0 2	N. by E. 3/4 E. S.S.W. 1/2 W.	2 1/2 2 1/2 F E

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs 2 1/2 knots at springs.
At 5 miles ditto ditto 3 to 3 1/2 knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. 1/2 E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. 1/2 N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	1/2 over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. 1/2 S. W. by N. 1/2 N.	Rate. 2 1/2 2 1/2	E. 1/2 N. W. 3/4 S.	Rate. 1 1/2 1 1/2 F E
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. 3/4 E. S. 3/4 W.	1.0 1 1/2	N.E. S. by W. 3/4 W.	1/2 1/2 F E

of the TIDAL STREAMS in the IRISH CHANNEL.

of the Stream.						Remarks on the Tides near the Land.	Position.
	$\frac{1}{2}$ over.		5 Miles.		From		
F	N.E. $\frac{1}{4}$ E.	Rate. $2\frac{1}{2}$	N.E. $\frac{1}{2}$ E.	Rate. $3\frac{1}{2}$ to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardigan Bay, sweeping more consequently an in-draught	On a line joining St. Davids Head and the Tuskar.
E	S.W. $\frac{1}{4}$ W.	$2\frac{1}{2}$	S.W. $\frac{1}{2}$ W.	4			
and more in as you near the land. There is into this bay on both ebb and flood.							
F	N.N.E. $\frac{3}{4}$ E.	$3\frac{1}{2}$	N.N.E.	3	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1h. 20m. in the Bardsey	On a line joining Bardsey Island and the Arklow Light Ship.
E	S.W. by S.	3	S.S.W.	$2\frac{1}{2}$			
Sound before it does in the offing; the flood setting strong into Caernarvon, and the ebb strong into Cardigan Bay, and <i>vice versâ</i> .							
E	N.N.E. $\frac{1}{4}$ E.	$2\frac{1}{2}$	N. by E. $\frac{1}{4}$ E.	$3\frac{1}{2}$	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and	On a line joining Holyhead and Kish Light Ship.
	S.W. $\frac{1}{4}$ S.	$2\frac{1}{2}$	S.W. $\frac{1}{4}$ S.	3			
more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.							

first quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N. W. and W. S. W. from the lighthouse, according to time of tide; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N.W. winds occasion the heaviest seas; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N.E. by E. $\frac{1}{2}$ E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

of the Stream.						Remarks on the Tides near the Land.	Position.
	$\frac{1}{2}$ over.		5 Miles.		From		
F	E. $\frac{1}{4}$ N.	Rate. 2	E. $\frac{3}{4}$ N.	Rate. 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on	On a line joining the Skerries and the Calf of Man.
E	W. by S. $\frac{1}{4}$ S.	$1\frac{1}{2}$	W. by S.	3			
thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.							
F	E. by N.	$1\frac{1}{2}$	S.E. by E. $\frac{1}{4}$ E.	2	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the	On a line joining the Calf of Man and Rockabill.
E	W. by S. $\frac{1}{4}$ S.	$1\frac{1}{2}$	N.N.W. $\frac{1}{2}$ W.	$1\frac{1}{2}$			
ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.							

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	$\frac{1}{2}$ over.			
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. $\frac{1}{2}$ N.	Rate. $3\frac{1}{2}$	E. $\frac{1}{2}$ N.	Rate. 2	F
			W. $\frac{1}{4}$ N.	$3\frac{1}{4}$	W. $\frac{1}{4}$ S.	2	E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs 2 knots at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of $3\frac{1}{2}$ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	s.w. by w. $\frac{1}{4}$ w.	$1\frac{1}{2}$	S.W. $\frac{1}{4}$ W.	$0\frac{1}{2}$	F
			N.E. $\frac{3}{4}$ E.	$1\frac{1}{2}$	N.E. $\frac{3}{4}$ N.		Drain E
On a line joining Peel and Mull of Gallo-way.	- - -	Peel -	E. $\frac{3}{4}$ N.	1	E. $\frac{3}{4}$ S.	$1\frac{1}{2}$	F
			W. $\frac{1}{4}$ N.	$1\frac{1}{2}$	W. by N.	$1\frac{1}{2}$	E

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	$\frac{1}{2}$ over.			
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	E.S.E.	Rate. $3\frac{1}{2}$	E. $\frac{1}{2}$ S.	Rate. $2\frac{1}{2}$	F
			W. $\frac{3}{4}$ N.	3	W. $\frac{3}{4}$ N.	$3\frac{1}{2}$	E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. by E.	$2\frac{1}{2}$	S. by E.	$2\frac{1}{2}$	F
			N.N.W. $\frac{1}{4}$ W.	$1\frac{1}{2}$	N.W. $\frac{3}{4}$ N.	2	

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. $\frac{1}{2}$ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	$\frac{1}{2}$ over.			
On a line joining Copeland Island and Mull of Gal-loway.	- - -	Copeland Island.	S. $\frac{3}{4}$ E.	Rate. 2	S. by E. $\frac{3}{4}$ E.	Rate. 2	F
			N. $\frac{3}{4}$ W.	2	N. by W. $\frac{3}{4}$ W.	$2\frac{1}{2}$	E

Magnetic Direction and Rate of the

After High Water at Liverpool.											
1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. $\frac{1}{2}$ E.		North		N. by W. $\frac{1}{2}$ W.		N.W. by N.		N.W. $\frac{1}{4}$ N.		S.W.	

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

of the Stream.					Remarks on the Tides near the Land.	Position.
$\frac{1}{2}$ over.		5 Miles.		From		
F S.E. by E. $\frac{1}{4}$ E. E W. by N. $\frac{3}{4}$ N.	Rate. 1 $\frac{1}{2}$	S.E. $\frac{1}{4}$ S. N.W. $\frac{1}{4}$ W.	Rate. 2 2	Walney Island.	The stream sets sharply round Walney Island into Morecambe Bay.	On a line join- ing Walney Island and the Calf of Man.
F S. $\frac{3}{4}$ E. E Slack	0 $\frac{1}{2}$	S. $\frac{1}{4}$ W. N. by W.	1 $\frac{1}{4}$ 1 $\frac{1}{4}$	Peel	To the N.W. of Peel the stream divides; one part runs towards the Calf,	On a line joining Peel and St. Johns Point.
the other turns to the N.E., passes Contrary Head, so called from the set of the tides off it, and runs with an increasing rate along the land to Jurby, and thence to the Point of Ayr.						
E. by S. $\frac{1}{4}$ S. W.N.W.	2 $\frac{3}{4}$ 2 $\frac{1}{4}$	E. by S. $\frac{1}{4}$ S. N.W. by W. $\frac{1}{4}$ W.	3 \cdot 0 3 $\frac{1}{4}$	Mull of Gal- loway.	Off the Mull of Galloway the stream attains its greatest strength, and occasions a race off the head; but there is usually a slack very close	On a line join- ing Mull of Galloway and Peel (Isle of Man).
to the shore, of which steamers who are acquainted take advantage. Between the Mull and Burrow Head the stream bends to the northward, and finally takes the curve of the bay of Luce, setting sharply into the bay round the Mull, and out round Burrow Head.						

of the Stream.			Remarks on the Tides near the Land.	Position.	
5 Miles.	From				
F E	East W. by N.	Rate. 4 4	Burrow Head	- - - - -	On a line join- ing Burrow Head and Point of Ayr.
F E	S.E. $\frac{3}{4}$ S. N.W.	1 $\frac{3}{4}$	St. Bees Head	Between King William Bank and St. Bees Head the stream is slack, but near St. Bees begins to run, one part passing up the Solway, the other going on towards Walney.	On a line join- ing St. Bees Head and Point of Ayr.

passes on to Maughold Head, where it meets with the tide from the southern channel. At half flood the stream at the Bahama runs towards Ramsay, and then turns to the north-west the rest of the tide.* A few miles westward of this spot, in latitude 54° 18' N. and longitude 4° W., the streams from the Calf of Man, and that which had passed over the Whitestone Bank, meet and thence run directly for Walney Island.

of the Stream.		Remarks on the Tides near the Land.	Position.
5 Miles.	From		
F S.S.E. $\frac{1}{4}$ E E N. by W. $\frac{3}{4}$ W.	Rate. 3 3	Mull of Gal- loway.	- - - - - On a line joining Mull of Gallo- way and Cope- land Island.

stream at the Bahama Light Vessel.

Before High Water at Liverpool.

5 Hours.		4 Hours.		3 Hours.		2 Hours.		1 Hour.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
S. 1/4 W.		S. 1/4 W.		S.W. 1/4 S.		N.W. 1/4 W.		N. by E.	

* See Bahama Light Vessel.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Copeland Islands and Lough of Belfast.

The main body of the stream, ebb and flood, crosses the entrance of this Lough in a curve from the Copeland Islands to Blackhead, and near the islands gains a strength of 5 knots; this curve bends more and more in until it stretches from Whitehead to Grey Point, when it divides, one part of the flood running up to Garmoyle, the other bending back and running towards Orlock, and near that place will carry a vessel upon the Briggs if not guarded against.

The first of the flood sets through the Copeland Sound and between the islands at a rapid rate, and care must be taken not to be swept into the intricate passage between the Copeland Islands. At half tide all the inshore part of the tide within $1\frac{1}{2}$ miles of the coast south of the Copelands slacks, and shortly turns to the northward and runs for 3 hours, whilst the stream in the offing is still going to the southward; so that from Ballyferris Point to Foreland Point, quite close in, the stream runs 9 hours to the northward and only 3 to the southward.

Position.	Remarks on the Tides near the Land.	Magnetic Direction			
		From	5 Miles.	$\frac{1}{2}$ over.	
On a line joining Corsewall Point and Sanda Sound.	Near Corsewall the stream gains strength, and close in takes the curve of the land, the flood setting to the S.W. round the lighthouse, and the ebb vice versa.	Corsewall Point.	S. $\frac{1}{2}$ E.	Rate. $1\frac{1}{2}$	S.E. $\frac{1}{2}$ S. $1\frac{1}{2}$ F
			N.N.W. $\frac{1}{2}$ W.	$1\frac{1}{2}$	N.W. $\frac{1}{2}$ N. $1\frac{1}{2}$ E
On a line joining Muck Island and Corsewall Point.	Close to Muck Island the stream attains great strength, the flood turning round Blackhead into the Lough of Belfast, but at a few miles off shore it runs straight on for the Copeland Islands.	Muck Island.	S. by E. $\frac{1}{2}$ E.	Rate. $1\frac{1}{2}$	S. by E. $\frac{1}{2}$ E. $1\frac{1}{2}$ F
			N. by W. $\frac{1}{2}$ W.	$1\frac{1}{2}$	N. by W. $\frac{1}{2}$ W. $1\frac{1}{2}$ E

The tides off Muck Island run from $3\frac{1}{2}$ to $4\frac{1}{2}$ knots close in, and occasion a race and heavy breaking sea at the springs; and in blowing weather there are races also off both Blackhead and Whitehead, and also the Gobbins; with the ebb-tide there is an eddy from half tide, close in with the shore, which may be taken advantage of by steamers at all times, and by sailing-vessels with a leading wind; but it does not extend sufficiently far off for sailing-vessels to benefit by it with a working wind, as they would be in danger of getting on the rocks if they missed stays.

Position.	Remarks on the Tides near the Land.	Magnetic Direction of the Stream.			
		From	$\frac{1}{2}$ over.	$\frac{1}{2}$ over.	
On a line joining Tor Point and Mull of Cantyre.	Close off Tor Point the flood runs upwards of four knots at springs.	Tor Point	S. by E. $\frac{1}{2}$ E.	Rate. 4	S. by E. $\frac{1}{2}$ E. 4 F
			N. by W. $\frac{1}{2}$ W.	$3\frac{1}{2}$	N.N.W. $3\frac{1}{2}$ E

of the TIDAL STREAMS in the IRISH CHANNEL—continued.

The 3rd quarter of the flood having turned to the northward, meets the tide through the Sound off the Deputy Reef, and they jointly strike off for the south end of the Copeland Islands and pass over the Bushes, and thence through the Channel between the Islands.

The eddy under Mew Island at this time rushes with great speed to the N.E. until it meets the true tide, and with it forms a race which sailing-vessels should avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

The last of the flood goes to the northward through the Sound, and splits off the south end of the Copeland, and one part runs for Mew Island, throwing off branches between the islands.

All about the Copeland Islands the eddies are very strong, and at night a vessel should be sure that she is outside the drift of the point of Mew Island.

of the Stream.			From	Remarks on the Tides near the Land.	Position.
	5 Miles.	Rate.			
F E. by S. $\frac{3}{4}$ S. E N.W. by W. $\frac{1}{4}$ W.	2 1 $\frac{3}{4}$		Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
F S. $\frac{1}{2}$ E. E N. by W.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$		Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.

After passing Whitehead, the tide slacks considerably as you enter the Lough. With the flood there is a strong eddy under Muck Island, which will be found very useful to steamers and even sailing-vessels beating along this coast; with a northerly wind they will do well to keep close in with the shore hereabout, as the strength of the flood strikes off from Muck Island in a S.E. direction, till it meets the stream which passes the eastern side of the Maidens, when it takes a channel direction; the meeting of these two tides appear to have occasioned a deep ditch, in which will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.	Position.
Near the Mull of Cantyre the stream runs 5 knots, and occasions a heavy dangerous sea in bad weather; with either tide, quite close in, there is an eddy. From the Mull of Cantyre the flood takes a direction nearly for Sanda Island, and divides off its western end: one part passing inside the island and up Kilbrennen Sound, the other running on for the Clyde.	On a line joining Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

BY CAPTAIN RICHARD HOSKYN, R.N.,
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(Formerly in charge of the Survey on the North-east Coast of Ireland.)

- Rate of tide.* ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{4}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.
- Eddy from Tor Point through the Sound.* On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.
- Eddy on south shore.* To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and true streams.
- Ebb stream.* During the first hour and half, the ebb stream sets round the Rue Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{4}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-more, which may be attended with danger to small vessels.
- Eddy in Church Bay.* The eddy from Church Bay has now forced the main stream into a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.
- Dangerous overfall.*
- Direction of ebb.*
- Flood stream.* The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, and rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the eastward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island; at the junction of the eddy and true streams there are great overfalls off Altacarry Head, and again off the Rue as mentioned above.
- Eddy to eastward of Island.*
- Navigation of Sound.* With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.
- Streams off Bengore Head.* Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

At the Skerry Islets the *ebb stream* sets fair through the anchorage and Sound to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in its passage between Ramore Head and the Carr Rocks, and creating a very troublesome sea.

Streams near the Skerry Islet.

The flood stream sets from Ramore Head towards the Carr Rocks; when the Sound is entered it sets fair through.

In Broad Sound it sets down on the Little Skerry, while the ebb inclines to the northward through the Sound.

At the anchorage under the Great Skerry there is little tide felt, on the flood it is slack water at half tide, on the ebb with the last quarter, while on the north side of the rocks the stream runs with a velocity of 3 knots.

As we proceed to the westward towards Lough Foyle the tide loses much of its strength, north of the mouth of the Bann, 3 miles off shore its average rate at springs is $1\frac{3}{4}$ knots.

To the westward.

There is an eddy tide all the way along the shore from the Skerry Islets to the mouth of the Bann, commencing at half tide, the line of its junction with the main stream being marked by a strong rippling.

Eddy.

Two miles north of Port Stewart the channel stream turns to the eastward 1 hour and 40 minutes after low water at Liverpool, or at high water on the adjoining shore, and to the westward 31 minutes after high water at Liverpool, or three quarters of an hour before low water on the adjoining shore, so that, on this part of the coast, the tide wave (with reference to its head at Liverpool) being nearly reversed, we witness (what to a person watching the rise and fall of the tide on the shore appears at first sight so anomalous) the whole of the ebb stream coming from the ocean, while the flood comes from the opposite quarter.

Off Port Stewart.

High and low water not occasioned by tidal stream,

Referring the tidal stream to the head of the tide at Liverpool, and the varying times of high water to the undulation of the tide wave, this apparent anomaly disappears.

but by tidal wave.

All this coast to the westward of Fair Head is subject to a ground swell, in fine weather the commencement of the east-going stream is made apparent by the sudden appearance of the swell, resuming again a comparative state of quiet when the west-going stream makes.

Ground swell.

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE TIDE AT DOVER.

Streams turn with the tides of Dover.

IN the English Channel, as before stated (page 120), the time of high water *at Dover* is to be taken as the standard, so that whenever either the time of the turn or the direction of the stream is required to be known, the time of the ship is to be compared with the time of high water for the day at the standard place, and the interval sought in the table which accompanies these remarks, and in the column answering to the ship's position will be found the information required.*

Tidal Compartments.

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channels, for the courses of the stream in the mixed tides are so changeable that a very different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, whether N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

1st Compartment.

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining Ushant and Scilly.*

2d Compartment.

The 2d compartment comprises a space eastward of the before-mentioned line from Ushant to Scilly, and as far as a *line joining the Start and the Casquets.* In this part of the Channel there is a mixed tide, partaking of the joint directions of the Channel and Offing streams.

3d Compartment.

The 3d compartment is bounded on the west by the line joining the Casquets and the Start, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets into the true Channel stream which sets straight up and down Channel in the fairway, and will always carry a vessel *towards Beachy Head* while the water is *rising at Dover*, and *from it* while it is *falling there.*

4th Compartment.

The 4th compartment comprises the Gulf of St. Malo, an estuary which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity; and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets sharply *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across and out of* the Gulf, the north-eastern part of the stream sweeping round the Casquets towards Alderney, and through the Russel and other Channels about Guernsey towards the race of Alderney.

5th Compartment.

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the flood tide the western half of the bay is partly in eddy, and the tide slacks in all that part nearly an hour before high water at Dover, whilst in the eastern half of the bay it runs about half an hour longer than at Dover,

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

so that here a ship beating up Channel towards the end of a rising tide at Dover may prolong the tide in her favour by standing close over to the French Coast eastward of Havre. On approaching Boulogne, however, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and are turned down upon the French Coast, so that a ship, which on the English side would at this time have a stream setting straight up Channel, here encounters one upon her beam, sweeping her down towards the Somme, and hence probably the cause of some of the many disastrous losses which have occurred in this part of the Channel.

The 6th compartment is between Beachy Head and the North Fore-
land, and the Somme and Dunkerque. In this space the streams from
the Channel and North Sea *meet* while the water is *rising* at Dover, and
separate while it is *falling* there. The point of union and separation is
not, however, stationary, but moves from west to east both on the
rising and falling water. For instance, an hour after high water at
Dover the separation begins off Beachy Head; in two hours it has reached
Hastings, in three hours Rye, and so it creeps on until at low water it has
gained the line extending from the North Foreland to Dunkerque. At
this time the offing streams on both sides have done, and it is slack water
all over the North Sea and English Channel as far as the true tide
extends; but the stream does not at this time cease in the intermediate tide.
When the water at Dover begins to rise, the stream on either side sets
towards Dover, and that from the North Sea consequently *goes with the*
intermediate tide, which had not yet ceased running to the westward,
while the other, the Channel stream, *opposes* it, and this opposition con-
tinues throughout the rising tide at Dover; the point of meeting gradually
shifting its position eastward as the tide advances on the shore.* About
the time when the water at Dover has done rising, the line of meeting has
reached the North Foreland, and the streams are now slack over the
Channels east and west, leaving the intermediate stream running alone
as before to the eastward. The next hour finds the offing streams made
down east and west, so that now the intermediate stream falls in with
the North Sea stream and goes with it, whilst on the west it separates
from the Channel stream, splitting at the same point, Beachy Head, as
at first.

Such is the general description of the course and routine of the tidal streams of the English Channel and intermediate tide, a careful perusal of which will enable the reader the more readily to understand the directions and tables annexed.

* The place of *meeting* begins off Beachy Head at *five hours before* high water on the same spot as that of the *separation* at *one hour after* high water; the place of *four hours before* high water is nearly the same as that of the separation at *two hours after*; and so on nearly with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every Hour of the Tide at DOVER.

COMPARTMENT I.

Westward of a Line joining Ushant and the Land's End.

Hours.	North Side of Latitude 49°00' N.						REMARKS.	South Side of 49°00' N.	
	West part.	Rate.	Near Scilly.	Rate.	Seven Stones.	Rate.		West part.	Rate.

COMPARTMENT II.

Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Iles.

Hours.	North Side of the Channel.						REMARKS.	South Side of the Channel.							
	West part.	Rate.	Centre.	Rate.	East part.	Rate.		West part.	Rate.	Centre.	Rate.	East part.	Rate.		
After High Water, Dover.	1	W. by N.	Greatest rate, springs, 2'00 knots.	W. ½ N.	Greatest rate, springs, 1'50 knots.	W. ½ N.	{ W. ½ S. near Hurd's Deep. }	W. ½ S.	Greatest rate, springs, 1'50 knots.	W. ½ N.	Greatest rate, springs, 2'30 knots.	W. ½ S.	Greatest rate, springs, 2'30 knots.		
	2	Turning.		W.N.W.		West.		Slack.		W. ½ S.		W. by S. ½ S.			
	3	North.		W. ½ N.		W. ½ S.		E. ½ N.		N.W. by W. ½ N.					
	4	E. ½ S.		Slack.		S. ½ W.		E. by N. ½ N.		E. by S. ½ S.					
	5	E. ½ N.		E. ½ S.		S.E. ½ S.		E. by N. ½ N.		E. ½ S.		E. by S. ½ S.			
	6	E. ½ S.		E. ½ S.		E. by S. ½ S.		E. ½ N.		S.E. by N. ½ S.		S.E. ½ S.			
Before High Water, Dover.	3	E. by S. ½ S.	Greatest rate, springs, 2'00 knots.	E. ½ S.	Greatest rate, springs, 1'50 knots.	E. ½ S.		Greatest rate, springs, 2'35 knots.		East.	Greatest rate, springs, 1'50 knots.	E. ½ S.	Greatest rate, springs, 2'30 knots.	E. by S. ½ S.	Greatest rate, springs, 2'30 knots.
	4	Slack.		E. by S.		E. ½ S.				N.W. by S. ½ S.		Slack.		E. ½ N.	
	5	Turning.		Slack.		E. ½ S.				Slack.		W. by N. ½ N.		N. ½ W.	
	6	W. ½ N.		West.		Turning.				S.W. by W.		Slack.		W. by N.	
	7	W. by S.		West.		W.S.W.				S.W. ½ W.		W. ½ N.		N.W. ½ W.	

COMPARTMENT III.

Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.	Off Cape Barbeur.	Rate.
After High Water, Dover.	1 W. ½ N.	Greatest rate, flood 2'30 knots, ebb 2'40 knots.	W. by N.	Greatest rate, flood 3'00 knots, ebb 3'10 knots.	Turning.	Greatest rate, flood 3'00 knots, ebb 3'40 knots.		W. ½ S.	Greatest rate, flood 2'15 knots, ebb 2'40 knots.	N.W. ½ W.	Greatest rate, flood 2'40 knots, ebb 2'50 knots.
	2 W. by N. ½ N.		W.N.W.		W. by N. ½ S.			W. ½ S.		N.W. ½ W.	
	3 W. ½ N.		W.N.W.		W. by N.			W. by S.		N.W. ½ W.	
	4 W. ½ S.		W. by N. ½ N.		W. ½ N.			N.W. by W. ½ W.		N.W. ½ W.	
	5 W. ½ S.		W. by N. ½ N.		W. ½ N.			W.S.W.		N.W. ½ W.	
	6 N.N.E.		W. by N. ½ N.		W. ½ N.			Slack.		N.W. ½ W.	
Before High Water, Dover.	1 East.	Greatest rate, springs 2'00 knots.	E. by S. ½ S.	Greatest rate, springs 2'00 knots.	E. by S. ½ S.	Greatest rate, springs 2'00 knots.		E. ½ S.	Greatest rate, springs 2'00 knots.	S.E. ½ E.	Greatest rate, springs 2'00 knots.
	2 E. by S. ½ S.		E.S.E.		E. by S.			E. ½ S.		S.E. ½ E.	
	3 E. by S. ½ S.		E.S.E.		E. by S. ½ S.			East.		S.E. ½ E.	
	4 E. by S. ½ S.				E. by S. ½ S.			E. ½ N.		S.E. ½ E.	
	5 E. by S. ½ S.				E. ½ S.			N.W. by S. ½ S.		S.E. ½ E.	
	6 E. by S. ½ S.		E. by S. ½ S.		E. ½ S.					S.E. ½ E.	

COMPARTMENT IV.

Entrance of Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island

Hours.	12 miles from Brehat Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
	Course.	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W. ¼ W.	Greatest rate, springs, uncertain knots.	W. ¼ N.	Greatest rate, springs, uncertain knots.		W. ¼ N.	Greatest rate, springs, uncertain knots.	W. by S.	Greatest rate, springs, knots.	S.W. by W. ¼ W.	Greatest rate, springs, 5 to 7 knots.
	2 S. ¼ W.		South			S.S.W.		S.W.		S.W. by W. ¼ W.	
	3 S. ¼ W.		S. ½ W.			S.S.W.		S.W.		S.W. by W. ¼ W.	
	4 S.E.		S.E. by S.			S.E. by E. ¼ E.		S. by E. ¼ E.		S.W. ¼ S.	
	5 S.E.		S.E. by E.			S.E. by E. ¼ E.		S.E. ¼ E.		S.W. ¼ S.	
	6 S.E. ¼ S.		S.E.			S.E. by E. ¼ E.		S.E. ¼ E.		N.E. by E. ¼ E.	
Before High Water, Dover.	5 S.E. ½ E.	Greatest rate, springs, uncertain knots.	S.E. by E. ¼ E.	Greatest rate, springs, uncertain knots.		{ S.E. by E. ¼ E. E. ¼ N. S.E. by E. ¼ E. E. ¼ N. }	Greatest rate, springs, uncertain knots.	E. by N.	Greatest rate, springs, knots.	N.E. by E. ¼ E.	Greatest rate, springs, 5 to 7 knots.
	4 ..		..			{ S.E. by E. ¼ E. E. ¼ N. }		N.E. ¼ N.		N.E. by E. ¼ E.
	3 N.W. by W. ¼ W.		N.W. ¼ N.			..		N.E. ¼ N.		N.E. ½ N.	
	2 N.W. by W. ¼ W.		N.W. ¼ W.			N.N.W.		N.E. by E.		N.E. ¼ N.	
	1 N.W. by W.		W. by N. ½ N.			N.N.W.		N.W. ¼ W.		N.E. ¼ N.	

COMPARTMENT V.

In the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

Hours.	West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
After High Water, Dover.	1 N.W. by N.	4:20 } knots. ebb 3:40	W.N.W.	3:20 } knots. flood 3:20	W. ¼ N.	3:30 } knots. ebb 3:00	
	2 N.N.W. ¼ W.		W.N.W.		W. by S.		
	3 N.N.W. ¼ W.		W.N.W.		W. by N.		
	4 N.W. by N.		W.N.W.		West		
	5 N.N.W.		N.W. by W. ¼ W.		West		
	6 Slack.		N.W. by W. ¼ W.		W. ½ S.		
Before High Water, Dover.	5 S.S.E. ¼ E.	Greatest rate, springs, -	E.S.E.	Greatest rate, springs, -	W. ½ S.	Greatest rate, springs, -	
	4 S.S.E. ¼ E.		E.S.E.		E.N.E.		
	3 S.S.E. ¼ E.		E.S.E.		E. by N. ¼ N.		
	2 S.E. ¼ S.		E.S.E.		E. by N. ¼ N.		
	1 S.E. ¼ S.		E.S.E.		E. by N. ¼ N.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and the North Foreland and Dunkerque.

Hours.	REMARKS.	West of	East of	Off Southsand Head.		Off Northsand Head.	
		Line of Separation.		Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 { The Tides separate on a line joining— Beachy Head and St. Valery	W. ¼ N.	N.E. by E.	N.E.	Greatest rate, springs, 3:3 knots.	N. by E. ¼ E.	
	2 Hastings and Treport	W. ¼ N.	N.E. by E.	N.E. ¼ E.		N. by E. ¼ E.	
	3 Hastings and Cayeux	West	N.E. by E. ¼ E.	N.E. by E. ¼ E.		N.E.	
	4 Folkstone and Calais	W. by S. ¼ S.	N.E. by E. ¼ E.	N.E. by E. ¼ E.		E. ¼ S.	
	5 South Foreland and Point Gravelines . .	S.W. by W.	N.E. by E. ¼ E.				
	6 { Ramsgate and Nieuport, passing over North Sand Head, the South Line of the Falls, and the banks off Nieuport	W. by S. ¼ S.	{ E. ½ N. and Northward. }	S.W. ¼ S.		s. by w. ¼ w.	
Before High Water, Dover.	5 { The Tides meet on a line joining— Beachy Head and Point Ailly	Tides meet.		S.W. ¼ S.	Greatest rate, springs, 3:3 knots.	s. by w. ¼ w.	
	4 { Bexhill and Cayeux, both streams turning down towards the Somme	S.S.E. ¼ E.	S. by W.	S.W. ½ W.		s. by w. ¼ w.	
	3 { The Tides meet on a line joining Rye and the Somme, passing over the Bassurelle, both tides setting to the Somme	S.E. by E. ½ E.	S.W. ¼ W.	W.S.W.		s. by w. ¼ w.	
	2 { The Tides meet on a line joining— Dungeness and Touquet Point	E. by N. ¼ N.	W. by S. ¼ S.	W. ½ N.		s. by w. ¼ w.	
	1 Do. Dover and Dunkerque nearly	N.E. by E. ¼ E.	s.w. by w. ¼ w.	N. by E. ¼ E.		s. by w. ¼ w.	

SECTION III.

TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light and the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
True Stream.*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at that place*.* This stream sets nearly N.E. and S.W., except near the coasts, where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz., at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, and 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel of 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel of 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel of 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel of 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and the Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly 40 minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGOLAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.

Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles north of North Foreland.		Galloper Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. $\frac{1}{4}$ N.	Greatest rate, springs, 2'50 knots.	Slack.	Greatest rate, springs, 3'00 knots.	N.E. $\frac{1}{4}$ N.	Greatest rate, springs, 2'80 knots.	N.N.W. $\frac{1}{4}$ W.	1'80	N.E. $\frac{1}{4}$ E.	Greatest rate, springs, 2'5 knots.
	2 Slack.		N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.	1'20	N.E. $\frac{1}{4}$ E.	
	3 E. $\frac{1}{4}$ S.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.	1'18	N.E. $\frac{1}{4}$ E.	
	4 East.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		E. by S.	1'46	N.E. $\frac{1}{4}$ E.	
	5 East.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		E. by S.	1'60	N.E. $\frac{1}{4}$ E.	
	6 E. $\frac{1}{4}$ S.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		S.E. $\frac{1}{4}$ E.	1'45	N.E. $\frac{1}{4}$ E.	
Before High Water, Dover.	5 E. $\frac{1}{4}$ S.	Greatest rate, springs, 2'50 knots.	..	Greatest rate, springs, 3'00 knots.	S.W. $\frac{1}{4}$ S.	Greatest rate, springs, 2'80 knots.	S.S.E. $\frac{1}{4}$ E.	1'30	S. $\frac{1}{4}$ W.	Greatest rate, springs, 2'5 knots.
	4 Slack.		S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ W.	1'36	S.W. $\frac{1}{4}$ S.	
	3 W. $\frac{1}{4}$ S.		S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.	1'60	S.W. $\frac{1}{4}$ W.	
	2 W. $\frac{1}{4}$ S.		W. by S. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.	1'65	s.w. by w. $\frac{1}{4}$ w.	
	1 W. $\frac{1}{4}$ S.		W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W. by W. $\frac{1}{4}$ W.	1'40	s.w. by w. $\frac{1}{4}$ w.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hours.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 N.E.	Greatest rate, springs, {flood 2'50 knots. ebb 2'50 knots.}	E.N.E.	Greatest rate, springs, {flood 2'50 to 3'0 kts. ebb 2'00 to 3'0}	N.E. by E. $\frac{1}{4}$ E.	Greatest rate, springs, 2'50 to 2'90 knots.	Stream from the Schelde N.W. by W. $\frac{1}{4}$ W. to 3° E. turning sharply to the N.E. Stream from the Schelde N.W. by W. $\frac{1}{4}$ W. to 2'30 E. turning sharply to N.N.E. $\frac{1}{4}$ E.
	2 N.E. $\frac{1}{4}$ E.		N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		
	3 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		
	4 N.E. by E.		N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		
	5 N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		
	6 N.E.		N.E. $\frac{1}{4}$ N.		N.N.E.		
Before High Water, Dover.	5 S.W. $\frac{1}{4}$ S.	Greatest rate, springs, {flood 2'50 knots. ebb 2'50 knots.}	S.W. by W. $\frac{1}{4}$ W.	Greatest rate, springs, {flood 2'50 to 3'0 kts. ebb 2'00 to 3'0}	S.W. by W. $\frac{1}{4}$ W.	Greatest rate, springs, 2'50 to 2'90 knots.	Stream from the Schelde N.W. by W. $\frac{1}{4}$ W. to 3° E. turning sharply to the N.E. Stream from the Schelde N.W. by W. $\frac{1}{4}$ W. to 2'30 E. turning sharply to N.N.E. $\frac{1}{4}$ E.
	4 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ W.		
	3 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		
	2 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		
	1 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.W.		

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.	REMARKS.	
After High Water, Dover.	Stream runs northward.	
1		
2		
3		
4		
5		
Before High Water, Dover.	Stream runs southward.	
1		
2		
3		
4		
5		

Taking the direction of the land, except close to the banks, for which special instructions are necessary.

COMPARTMENT IX.—*continued.*

Hours.	Shipwash Light Vessel.		Stanford Light Vessel.		St. Nicholas Gat Light Vessel.		Cockle Light Vessel.		Newarp Light Vessel.		Hasborough Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 E.N.E.		N.E. by N.		N. $\frac{1}{2}$ E.		N. by E. $\frac{3}{4}$ E.		N. $\frac{1}{2}$ W.		N. by W. $\frac{3}{4}$ W.	
	2 E.N.E.		N.E. by N.		North		N. by E. $\frac{3}{4}$ E.		N. $\frac{1}{2}$ W.		N. by W. $\frac{3}{4}$ W.	
	3 E.N.E.		N.E. by N.		North		N. by E. $\frac{3}{4}$ E.		N. $\frac{1}{2}$ W.		N. by W. $\frac{3}{4}$ W.	
	4 E.N.E.		N.E. $\frac{1}{2}$ N.		N. $\frac{3}{4}$ W.		N. by E. $\frac{3}{4}$ E.		N. $\frac{1}{2}$ W.		N. by W. $\frac{3}{4}$ W.	
	5 N.E. by E. $\frac{1}{2}$ E.		N.E. $\frac{1}{2}$ E.		N. by W.		N. by E. $\frac{3}{4}$ E.		N. $\frac{1}{2}$ W.		N. by W. $\frac{3}{4}$ W.	
	6 N.E. $\frac{1}{4}$ N.		Slack		N. by W. $\frac{1}{4}$ W.		South on the turn.		North		S. by E. $\frac{1}{4}$ E.	
Before High Water, Dover.	5 S.W. $\frac{1}{2}$ W.		S.W. by S.		S. $\frac{1}{2}$ E.		South		S. $\frac{1}{2}$ E.		S. by E. $\frac{3}{4}$ E.	
	4 S.W. by W.		S.W. by S.		S. $\frac{1}{2}$ E.		South		S. $\frac{1}{2}$ E.		S. by E. $\frac{3}{4}$ E.	
	3 S.W. by W.		S.W. by S.		S. $\frac{1}{4}$ W.		South		S. $\frac{1}{2}$ E.		S. by E. $\frac{3}{4}$ E.	
	2 S.W. by W.		S.S.W. $\frac{3}{4}$ W.		S. $\frac{1}{2}$ W.		South		S. $\frac{1}{2}$ E.		S.S.E. $\frac{1}{4}$ E.	
	1 S.W. by W.		S.S.W. $\frac{1}{2}$ W.		S. by W.		South		S. $\frac{1}{2}$ E.		S by E. $\frac{1}{4}$ E.	

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 N.E. $\frac{3}{4}$ N.	Greatest rate, springs, 2'25 knots.	N.E. $\frac{1}{4}$ N.	Greatest rate, springs, 1'60 knots.	N.E. by N. *	flood 1'40 } knots. ebb 1'40 }	N. by W. $\frac{1}{4}$ W.	flood 2'60 } knots. ebb 3'00 }	* Turning sharply off for the Leman and Ower.
	2 N.E. $\frac{1}{2}$ N.		N.E. $\frac{3}{4}$ N.		N.E. by N.		N. $\frac{1}{4}$ E.		
	3 N.E. $\frac{1}{4}$ N.		N.E.		N.N.E.		N.N.E.		
	4 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{2}$ N.		N.E.		N. $\frac{1}{2}$ W.		
	5 N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		N. $\frac{3}{4}$ W.		
	6 N.E. by N.		N.E. $\frac{1}{4}$ N.		N.N.E. $\frac{3}{4}$ E.		N.N.E.		
Before High Water, Dover.	5 S.W. $\frac{3}{4}$ S.	Greatest rate, springs, 2'00 knots.	S.W. $\frac{1}{2}$ W.	Greatest rate, springs, 2'25 knots.	S. $\frac{3}{4}$ E.	Greatest rate, springs, { flood 1'70 } knots. ebb 2'00 }	S. $\frac{1}{2}$ W.	Greatest rate, springs, { flood 1'70 } knots. ebb 2'00 }	Stream setting round Texel south-westerly.
	4 S.W. $\frac{1}{4}$ S.		S.W. by S.		S. $\frac{1}{4}$ E.		S. $\frac{1}{2}$ W.		
	3 S.W. $\frac{3}{4}$ S.		S.W. $\frac{1}{2}$ S.		S. by W.		S. $\frac{3}{4}$ W.		
	2 S.W. $\frac{1}{4}$ S.		S.W. $\frac{3}{4}$ S.		S.S.W.		S. by W. $\frac{3}{4}$ W.		
	1 S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		S. by W.		

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 N.E. $\frac{1}{4}$ N.	Greatest rate, springs, 2'00 knots.	Slack.	Greatest rate, springs, 2'25 knots.	N.E. $\frac{3}{4}$ N.	flood 1'70 } knots. ebb 2'00 }	N.E. $\frac{3}{4}$ N.	flood 1'70 } knots. ebb 2'00 }	Stream setting round Texel south-westerly.
	2 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{2}$ N.		
	3 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
	4 N.E. $\frac{3}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E.		N.E. $\frac{1}{4}$ N.		
	5 N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		
	6 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
Before High Water, Dover.	5 S.W. $\frac{1}{2}$ S.	Greatest rate, springs, 2'00 knots.	S.W. $\frac{3}{4}$ S.	Greatest rate, springs, 2'25 knots.	S. by E. $\frac{3}{4}$ E.	Greatest rate, springs, { flood 1'70 } knots. ebb 2'00 }	S.E. by S.	Greatest rate, springs, { flood 1'70 } knots. ebb 2'00 }	Stream setting round Texel south-westerly.
	4 S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		S. by W. $\frac{3}{4}$ W.		S. $\frac{1}{4}$ E.		
	3 S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{4}$ W.		S.W. $\frac{3}{4}$ S.		S.W. $\frac{3}{4}$ S.		
	2 S.W. $\frac{3}{4}$ S.		S.W. $\frac{1}{2}$ W.		S.W. $\frac{3}{4}$ S.		S.W. $\frac{3}{4}$ S.		
	1 S.W. $\frac{1}{2}$ S.		S.W.		S.W. $\frac{3}{4}$ S.		S.W. $\frac{3}{4}$ S.		

COMPARTMENT XII.

Between the latitude 52° and 53° N. and from longitude 4° E. to the Coast of the Netherlands.

Hours.		REMARKS.
After High Water, Dover.	1 2 3 4 5 6	<p>Stream runs northward.</p> <p>The stream takes the direction of the land, except close to the banks, for which special instructions are necessary.</p> <p>Stream runs southward.</p>
Before High Water, Dover.	5 4 3 2 1	

COMPARTMENT XIII.

Between the latitude 53° and 54° N. and from longitude 1° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	N.W. Quarter.	Leman and Ower Light Vessel.		REMARKS.
							Course.	Rate.	
After High Water, Dover.	1 N.N.W. $\frac{1}{2}$ W.	Greatest rate, springs, { flood 2'25 } knots. ebb 2'25 }	1 N. by W. $\frac{1}{2}$ W.	Greatest rate, springs, { flood 2'00 } knots. ebb 2'30 }	1 N.N.W. $\frac{1}{2}$ W.	1 N. $\frac{1}{2}$ W.	N.N.W.	Greatest rate, springs, 2'0 knots.	Near the north point of Smith's Knoll the rates are, flood 2'6, ebb 3'0 knots.
2	2 N.W. $\frac{1}{2}$ N.		2 N. by W. $\frac{1}{2}$ W.		2 N. $\frac{1}{2}$ W.	2 N. by W.	N.N.W.		
3	3 N.N.W. $\frac{1}{2}$ W.		3 North.		3 N. $\frac{1}{2}$ E.	3 N. by W. $\frac{1}{2}$ W.	N.N.W. $\frac{1}{2}$ W.		
4	4 N.N.W. $\frac{1}{2}$ W.		4 North.		4 N. by E. $\frac{1}{2}$ E.	4 N.W. $\frac{1}{2}$ W.	N.N.W. $\frac{1}{2}$ W.		
5	5 N.W. by N.		5 North.		5 N.E. by E. $\frac{1}{2}$ E.	5 S. by W.	N.N.W. $\frac{1}{2}$ W.		
6	6 - - -		6 N.N.E.		6 S.E. $\frac{1}{2}$ E.	6 S. $\frac{1}{2}$ E.	Slack.		
Before High Water, Dover.	5 S.E. by S.	Greatest rate, springs, { flood 2'00 } knots. ebb 2'30 }	5 S.E. by S.	Greatest rate, springs, { flood 2'00 } knots. ebb 2'30 }	5 S.E. $\frac{1}{2}$ S.	5 S. $\frac{1}{2}$ E.	S.S.E. $\frac{1}{2}$ E.		
4	4 S.E. by S.		4 S.E. by S.		4 S. by E.	4 S. by E. $\frac{1}{2}$ E.	S.S.E. $\frac{1}{2}$ E.		
3	3 S.S.E. $\frac{1}{2}$ E.		3 S. by E. $\frac{1}{2}$ E.		3 S. $\frac{1}{2}$ E.	3 S.S.E. $\frac{1}{2}$ E.	S.S.E. $\frac{1}{2}$ E.		
2	2 S. by E. $\frac{1}{2}$ E.		2 S. $\frac{1}{2}$ E.		2 S. $\frac{1}{2}$ W.	2 E. by S. $\frac{1}{2}$ S.	S.S.E. $\frac{1}{2}$ E.		
1	1 S.S.E. $\frac{1}{2}$ E.		1 S. $\frac{1}{2}$ W.		1 S. $\frac{1}{2}$ E.	1 N.N.E. $\frac{1}{2}$ E.	S.S.E. $\frac{1}{2}$ E.		

COMPARTMENT XIV.

Between the latitude 53° and 54° N. and 3° to 5° E. longitude.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 W. by N. $\frac{1}{2}$ N.	Greatest rate, } flood 1'20 } knots. } ebb 1'50 }	1 W. by S. $\frac{1}{2}$ S.	Greatest rate, } flood 1'35 } knots. } ebb 3'00 }	1 W. by S.	Greatest rate, } flood 0'80 } knots. } ebb 1'00 }	1 S.W. $\frac{1}{2}$ W.	In the north-eastern quarter of this compartment the Helgoland stream joins the Channel stream on the falling water at Dover, and the streams split on the rising water at Dover, and a vessel to the northward of 53'30 on the rising tide will be set down towards Helgoland.	
	2 N.N.W. $\frac{1}{2}$ W.		2 W.S.W.		2 W. $\frac{1}{2}$ S.		2 N.W. by W. $\frac{1}{2}$ W.		
	3 N.N.W.		3 W. by S.		3 W. $\frac{1}{2}$ S.		3 N.W. $\frac{1}{2}$ N.		
	4 N. by E. $\frac{1}{2}$ E.		4 N.N.W. $\frac{1}{2}$ W.		4 N.N.W. $\frac{1}{2}$ W.		4 N. by W. $\frac{1}{2}$ W.		
	5 N.E. $\frac{1}{2}$ N.		5 N.E. $\frac{1}{2}$ N.		5 N.E. $\frac{1}{2}$ N.		5 N.N.E. $\frac{1}{2}$ E.		
	6 N.N.E. $\frac{1}{2}$ E.		6 N.E. by E. $\frac{1}{2}$ E.		6 E. by N.		6 E. by N. $\frac{1}{2}$ N.		
Before High Water, Dover.	5 East.	Greatest rate, } flood - } } springs, - }	5 E.N.E.	Greatest rate, } flood - } } springs, - }	5 E. $\frac{1}{2}$ S.	Greatest rate, } flood - } } springs, - }	5 S.E. by E. $\frac{1}{2}$ E.	Splitting on Texel Island.	
	4 S.E. $\frac{1}{2}$ S.		4 E.N.E.		4 E. by S.		4 S.E. $\frac{1}{2}$ E.		
	3 S. by E. $\frac{1}{2}$ E.		3 S.S.W.		3 S.E. by E.		3 S. $\frac{1}{2}$ E.		
	2 S. by W.		2 S.S.W. $\frac{1}{2}$ W.		2 S.E.		2 S.W. by S.		
	1 S.W. $\frac{1}{2}$ S.		1 S.W. $\frac{1}{2}$ S.		1 S. by E.		1 S.W. $\frac{1}{2}$ S.		

Splitting on Texel Island.

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. ½ E.	Greatest rate, } flood 2.50 } knots. } ebb 3.75 }	N.E. by E. ¾ E.	Greatest rate, springs, 3.25 knots.	N. by W. ¾ W.	Greatest rate, springs, 2.5 knots.
	2 N.N.W. ½ W.		S.S.W. ¾ W.		N.N.W. ¾ W.	
	3 -		S.W. ¾ S.		N.W. ½ N.	
	4 S.W. ¾ S.		S.W. ¾ S.		W. by S.	
	5 S.W. ¾ W.		S.W. ¾ S.		S.W. ¾ S.	
	6 S.W. by S.		S.W. ¾ S.		S. ¾ E.	
Before High Water, Dover.	5 S. by E.	Greatest rate, } springs, - }	S.W. ¾ S.	Greatest rate, springs, 3.25 knots.	S.S.E.	Greatest rate, springs, 2.5 knots.
	4 S.S.E.		N.E. ¾ E.		S.S.E. ¾ E.	
	3 S.S.W.		N.E. by E. ¾ E.		S.E. ¾ E.	
	2 N. by E.		N.E. by E. ¾ E.		E. ¾ S.	
	1 N.N.E.		N.E. by E. ¾ E.		N.E. ¾ N.	

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by W. ¾ W.	Greatest rate, 1 knot.	N.N.W. ¾ W.	Greatest rate, 1 knot.	N.W. ½ W.	Greatest rate, 1 knot.	W.N.W.	Greatest rate, 1 knot.
	2 N. by W. ¾ W.		N.W.		N.W. by W. ¾ W.		W. by N. ¾ N.	
	3 N.W. ¾ N.		N.W. ¾ W.		N.W. by W. ¾ W.		W. ¾ N.	
	4 S. ¾ E.		W. by N. ¾ N.		N.W. ¾ N.		N. by W.	
	5 S. ¾ E.		W. ¾ S.		N. by W. ¾ W.		N.E. ¾ N.	
	6 S.S.E. ¾ E.		S. by E. ¾ E.		E. by N. ¾ N.		E. by N. ¾ N.	
Before High Water, Dover.	5 S.E. ¾ S.	Greatest rate, 1 knot.	S.E. ¾ S.	Greatest rate, 1 knot.	E. by S.	Greatest rate, 1 knot.	E. by N.	Greatest rate, 1 knot.
	4 S.E. by E. ¾ E.		S.E. ¾ E.		E. by S.		E. ¾ S.	
	3 East.		S.E. ¾ E.		E. by S.		E. ¾ S.	
	2 N.E. ½ N.		S. by E. ¾ E.		E. by S. ¾ S.		S.E. ¾ E.	
	1 N. by E.		E. by N. ¾ N.		South.		S. by E. ¾ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W.N.W.	Greatest rate, 1 knot.	W. ¾ N.	Greatest rate, 1 knot.	W. ¾ S.	Greatest rate, 1 knot.	E. by N. ¾ N.	Greatest rate, 1 knot.
	2 N.W. by W. ¾ W.		W. by N. ¾ N.		W. by N. ¾ N.		N.E. ¾ E.	
	3 W. by N. ¾ N.		W. by N. ¾ N.		W. by N. ¾ N.		N.W. ¾ W.	
	4 W. by N. ¾ N.		W. ¾ N.		W. by N. ¾ N.		W. by N. ¾ N.	
	5 W. by N. ¾ N.		W. by N. ¾ N.		W. by N. ¾ N.		N.W. by W. ¾ W.	
	6 W. by N. ¾ N.		W. by N. ¾ N.		W. by N. ¾ N.		W. ¾ S.	
Before High Water, Dover.	5 E. by S. ¾ S.	Greatest rate, 1 knot.	S.E. by E. ¾ E.	Greatest rate, 1 knot.	S.S.E. ¾ E.	Greatest rate, 1 knot.	W. by S. ¾ S.	Greatest rate, 1 knot.
	4 S.E. by E. ¾ E.		S.E. by E. ¾ E.		S.E. by E. ¾ E.		S.S.W.	
	3 S.E. ¾ E.		E. by S. ¾ S.		S.E. by E. ¾ E.		S. by E.	
	2 S.E. ¾ E.		E. by S. ¾ S.		S.E. by E. ¾ E.		S.E. by E. ¾ E.	
	1 S.E. by E. ¾ E.		E. by S. ¾ S.		S.E. by E. ¾ E.		E. by N. ¾ N.	

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

COMPARTMENT XVII.

On the parallel of 55° N.

Hours.	0° E.		1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.W. ¼ W.	¾	Slack.		N. by E. ¾ E.		W. ¼ S.		N.W. ¼ N.	
	2 S. by W.	¾	S.W. ¼ W.		S.W. by W. ¾ W.		W. ¼ N.		N.W. ¾ W.	
	3 S. by E. ¼ E.	1 ¼	S.S.W. ¼ W.		W.S.W.		W. ¼ N.		N.W. ¼ W.	
	4 S. ¾ E.	1	S. by W.		S.W. ¾ W.		N.W. by W. ¼ W.		N.W. ¼ W.	
	5 S. by E.	¾	S. by W.		S. ¾ E.		S.W. by W. ¼ W.		W. ¼ S.	
	6 S. ¾ E.	¾	South.		S.S.E.		S. by E. ¼ E.		S.E. by S.	
Before High Water, Dover.	5 S.E. ¼ S.	¾	S. ¾ E.		E. by S. ½ S.		S. ¾ E.		S.E. by E. ¾ E.	
	4 N.N.E. ¼ E.	¾	E. by N. ¾ N.		E. ¼ S.		S.E. by E. ¼ E.		E.S.E.	
	3 N. ¾ W.	1 ½	N. by E.		E. by N. ¼ N.		E. ¾ S.		E. ¼ S.	
	2 N. ¼ W.	1	N. by E. ¾ E.		E. ¼ N.		E. ¾ S.		E. ¼ N.	
	1 N. ¾ W.	¾	N. by E. ¼ E.		N.E. ¾ E.		N.N.E. ¾ E.		N. by E. ¼ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. ¼ W.		W. ¼ N.		W. by N. ½ N.		N. by W. ¾ W.	
	2 W. by N. ¼ N.		W. by N. ¾ N.		W. by N. ¼ N.		N. by W. ½ W.	
	3 W. by N. ¼ N.		W.N.W.		N.W. by W. ½ W.		N.W. ¼ N.	
	4 W.N.W.		W. by N. ¼ N.		W. by N.		N.N.W. ¾ W.	
	5 W. ¼ N.		W. by N. ¾ N.		W. ¾ N.		N.W. ¼ W.	
	6 Turning.		N.W. by W. ¾ W.		W. ¾ S.		N.W. by W. ¼ W.	
Before High Water, Dover.	5 E. ½ S.		S.E. ¼ S.		S.W. ¼ W.		W. ¼ S.	
	4 E. by S. ½ S.		S.E. ¾ S.		S. ¾ E.		S. by W. ¼ W.	
	3 E. by S. ¼ S.		S.E. by S.		S.E. by S.		S. ¼ W.	
	2 E. by S. ¼ S.		S.S.E. ¼ E.		S.E. ¾ S.		S. ¾ E.	
	1 E. ¼ S.		S.S.E. ¾ E.		S.E. ¾ S.		S. by E. ¾ E.	

COMPARTMENT XVIII.

On the parallel of 56° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.E.		Slack.		N.W. ¼ W.		N. ¼ E.	
	2 Slack.		S.W. ¼ W.		W. by N. ¾ N.		N.N.W. ¾ W.	
	3 S. ¼ W.		S.W.		N.W.		N.W. ¼ W.	
	4 S. ¼ E.		W. by S. ¼ S.		N.W. ¼ W.		N.E.	
	5 S. ¼ E.		S. by E.		N.N.W.		N.E. by E.	
	6 S. ¾ E.		S. by E.		N. ¾ W.		E. ¼ S.	
Before High Water, Dover.	5 E.S.E.		E. ¾ S.		N. by E. ¼ E.		E. by N.	
	4 N.E. by E.		E.N.E.		N.E. ¼ E.		E. by N.	
	3 N.E. by N.		N.E. by E. ¾ E.		E. ¼ N.		N.E. by E. ¼ E.	
	2 N.N.E. ¾ E.		N.E. by E. ¼ E.		N.E. ¾ E.		E.N.E.	
	1 N.E. ¼ E.		N.E. ¾ E.		N. ¼ W.		N.E. by E. ¼ E.	

COMPARTMENT XVIII.—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 Turning.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	E.N.E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2 W. $\frac{1}{4}$ S.		N.N.W. $\frac{1}{4}$ W.		N.N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ E.	
	3 N.W. $\frac{1}{4}$ N.		N.N.W. $\frac{1}{4}$ W.		N. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.	
	4 N.N.W.		N.N.W.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	5 N.N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	6 N.E. $\frac{1}{4}$ E.		N. by E. $\frac{1}{4}$ E.		N. by W. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
Before High Water, Dover.	5 E. by N. $\frac{1}{4}$ N.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. by E. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N. by W. $\frac{1}{4}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.N.W. $\frac{1}{4}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	4 N.E. by E. $\frac{1}{4}$ E.		E. by N. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ E.	
	3 E. by N. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ W.	
	2 E. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ S.		E. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.	
	1 E. $\frac{1}{4}$ N.		E. $\frac{1}{4}$ S.		S.E. by E.		S.W. $\frac{1}{4}$ W.	

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	5° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{4}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{4}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{4}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.	
	3 S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ W.	
	4 N. $\frac{1}{4}$ W.		W.S.W.		S. $\frac{1}{4}$ W.	
	5 Slack.		Slack.		S. $\frac{1}{4}$ E.	
	6 N.N.E. $\frac{1}{4}$ E.		N. by E.		Slack.	
Before High Water, Dover.	5 N.E. by N.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N. by E. $\frac{1}{4}$ E.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N.E. $\frac{1}{4}$ N.		N. by E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ E.	
	3 N.N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		N. by E. $\frac{1}{4}$ E.	
	2 N.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N.N.E.	
	1 S. $\frac{1}{4}$ E.		N.E. by E. $\frac{1}{4}$ E.		N. by E. $\frac{1}{4}$ E.	

COMPARTMENT XIX.—continued.

Hours.	5°		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. ¼ E.	Greatest rate 1 1/3 knot about half tide.	S. by E. ¼ E.	Greatest rate ¼ knot about half tide.	N.E. by E. ¾ E.	Greatest rate ¾ knot about half tide.	S.S.E. ¼ E.	Rate 0·9 knot.
	2 N.N.E. ¾ E.		S. ¼ E.		E. by N. ¾ N.		Slack.	
	3 S.W. ¼ S.		S. ¾ W.		N.E. by E. ¾ E.		N.N.E. ¾ E.	
	4 N.N.W. ¼ W.		N. by E. ¾ E.		N.E. by E. ¾ E.		N.E. by N.	
	5 N. by W.		N. ¼ W.		N.E. by E. ¾ E.		N ¼ W.	
	6 N. by E. ¼ E.		N. ¼ W.		N. by E. ¾ E.		N. ¾ E.	
Before High Water, Dover.	5 N.E. ¼ N.	Greatest rate 1 1/3 knot about half tide.	N. ¾ E.	Greatest rate ¼ knot about half tide.	N.E. by N.	Greatest rate ¾ knot about half tide.	N.E.	Rate 0·9 knot.
	4 N.E. ¼ N.		N.N.E. ¼ E.		N.N.E. ¾ E.		N.N.E. ¼ E.	
	3 N.E.		N.E. ¼ E.		N.E. ¼ N.		N.E. by E. ¾ E.	
	2 E. by N.		E. by N. ¼ N.		N.E. ¼ N.		N.E. by E. ¾ E.	
	1 E. ¼ N.		E. by N. ¼ N.		N.E. ¼ N.		E. by N. ¾ N.	

COMPARTMENT XX.

On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S. ¼ E.	Greatest rate 1 knot about half tide.	S.E. ¼ E.	Greatest rate 0·6 knot about half tide.	S. by W. ¾ W.	Greatest rate 1 knot about half tide.		
	2 S.E. ¼ S.		S.E. ¼ E.		S. by W. ¾ W.			
	3 E. ¼ N.		S. ¼ E.		S. by W. ¾ W.			
	4 E. ¾ S.		S.E. ¼ S.		Slack.			
	5 Slack.		Slack.		N.W. by N.			
	6 S.W. ¼ S.		N. by W. ¼ W.		N. by E. ¾ E.			
Before High Water, Dover.	5 West.	Greatest rate 1 knot about half tide.	N.W. ¾ W.	Greatest rate 0·6 knot about half tide.	N.N.E. ¼ E.	Greatest rate 1 knot about half tide.		
	4 W. by N. ¼ N.		N.W. ¼ W.		N.E. ¼ N.			
	3 N.W. by W. ¾ W.		N.W. ¾ N.		N.E. ¼ E.			
	2 W. ¾ N.		West		S.S.E. ¾ E.			
	1 W. ¼ N.		S. by E.		S.S.E. ¼ E.			

Hours.	1° E.		2° E.		3° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. ¼ S.	Greatest rate ¼ knot about half tide.	S.W. ¼ S.	Greatest rate ¼ knot about half tide.	S. by E. ¼ E.	
	2 W. ¼ S.		S.W. by W. ¾ W.		S. ¼ E.	
	3 Slack.		W. by N. ¼ N.		South.	
	4 Slack.		N.W. ¼ N.		S. by W. ¾ W.	
	5 N. by E. ¾ E.		N. ¼ E.		S. ¼ W.	
	6 N. by E. ¾ E.		N. ¾ E.		E. by N. ¼ N.	
Before High Water, Dover.	5 N. by E. ¾ E.	Greatest rate ¼ knot about half tide.	N. ¾ E.	Greatest rate ¼ knot about half tide.	N.E. by E. ¾ E.	
	4 N. by E. ¾ E.		N. by E.		N.E. by E. ¾ E.	
	3 N. by E. ¼ E.		N. ¾ E.		E. by N. ¼ N.	
	2 Turning.		N.E. ¼ E.		E. by S. ¼ S.	
	1 W. by N. ¼ N.		S.E. ¼ E.		S.E. by E. ¼ E.	

TIDAL STREAMS.

COMPARTMENT XXI.

On the parallel of 59° N.

Hours.	2° W.		1°		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. & W.	Greatest rate 1 knot about half tide.	S.S.W. & W.	Greatest rate 0·5 knot about half tide.	S.W. by W. & W.	Greatest rate & knot about half tide.
	2 S. by W. ½ W.		S.S.W. & W.		W. by S. ½ S.	
	3 S. ½ W.		S.S.W. & W.		N. by R. & E.	
	4 S.W. by W. & W.		Slack.		N.E. & N.	
	5 W. & N.		Slack.		N.E.	
	6 N.W. & W.		N. ½ E.		N.E. & E.	
Before High Water, Dover.	5 N.W. by N.	Greatest rate 1 knot about half tide.	N.N.W. & W.	Greatest rate 0·5 knot about half tide.	N.E. & E.	Greatest rate & knot about half tide.
	4 N.W. & N.		N.N.W. & W.		E. by N. & N.	
	3 W. by N. & N.		N.W. & N.		S.E. ½ E.	
	2 S.W. by W. & W.		S.W. by W.		S.S.W. & W.	
	1 S.W.		S.W. by S.		S.W. by W. & W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS;
WITH THE RISE OF THE TIDE
AT SPRINGS AND NEAPS.

AUTHORITIES.

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Bellingshausen, Krusenstern, Lisiansky, and Lütke of the Russian Navy.

Tasman, Melville, Smits, Swart, and Van Rhyn of the Dutch Navy.

Klint, Löwenorn, and Zahrtmann of the Danish and Swedish Navies.

Banza, Malaspina, and Tofiño of the Spanish Navy.

U. S. Coast Survey under Professor A. D. Bache. Maury and Wilkes of the U. S. Navy.

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

T I M E
OF
HIGH WATER ON FULL AND CHANGE DAYS
AT THE PRINCIPAL PLACES ON THE GLOBE ;
ARRANGED ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE ;
*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>England, South Coast.</i>							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Scilly Is. (St. Agnes)	4 30	16	12	Teignmouth	6 0	13	9½
—— (St. Mary)	4 18	15½	11½	Torbay	6 0	13½	10
—— (Trescow)	4 22	16½	12½	Exmouth	6 21	12½	8½
Pensance	4 30	16½	12½	Lyme Regis	6 21	11½	8½
Lizard (Perran } Vose Cove) - }	5 0	14½	10½	Bridport	6 5	11½	7½
Coverack	4 35	14½	11½	Chesilton	6 13	10½	7
Helford (entrance)	4 43	15½	11½	Portland Breakwater	7 1	6½	4½
Falmouth	4 57	16	12	Poole	9 10	6½	4½
—— Truro }	5 5	10	6	Christchurch	9 0	5	
(Town Quay) - }	5 4	15½	12	Needles Point	9 46	7½	5
Mevagizey	5 14	15	11½	Hurst, Camber	10 0	7½	6
Fowey	5 26	16	13	Yarmouth	12 0	7	6½
East Looe	5 37	15½	11½	West Cowes	10 45	12½	9½
Plymouth Breakwater	5 32	15½	11½	Lymington	11 45	8	6
—— Sutton }	5 43	15½	11½	Beaulieu	12 15	10	8½
Pool	5 45	15	11	Calshot	10 25	13	9½
Devonport Dk. Yard	5 47	14½	10½	(Castle Point)	12 15	13	9½
Saltash, R. Tamar	5 55	13½	9½	Southampton	10 30	13	9½
Cargreen	6 6	12½	8½	—— Red-	12 45	8½	6
Pentillie	6 12	10½	6½	bridge	10 42	8½	6
Calstock	6 17	5½	1½	Portsmouth Dock	12 57	12½	10
Morewellham	5 47	14½	10½	Yard	11 41	13½	10½
Weir Head	5 47	8½	4½	Port-	11 46	6½†	4†
Warleigh Quay, }	5 37	16½	11½	chester (off the			
R. Tavy }	5 40	16½	11½	Castle)			
Maristow	5 47	16½	11½	Ports-			
Bigbury B., R. Yealm	5 45	15?	11?	bridge (a ½ mile			
—— R. Erme	5 41	15	11½	W. of bridge) - }			
—— R. Avon	5 46	10					
Bolt Head	6 16	14½	10½				
Salcombe							
—— Kings-							
bridge							
Dartmouth							

* By the Rise of the tide is meant its vertical rise above the mean low water level of spring-tides.
† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Portsmouth Fare- ham (in Chan- nel close to the Upper Quay) -	h. m. 11 48	ft. 11½	ft. 8½	Ferry Side -	h. m. 5 49	ft. 23	ft. 16½
Bridge -	11 51	7½	4½	Llanelly (Bar) -	6 16	28	21
Ryde -	11 20	13½		Caermarthen (Bar)	5 44	26	19½
Bembridge Point -	11 0	14	10½	Caldy Road -	5 40	27	20
Chichester -	11 30	14	11	Tenby -	5 42	27	20
Pagham (entrance)	11 30	16½	12½	Milford (St. Ann } Lighthouse) - }	5 56	24	18
Selsea Bill -	11 45	16½	12½	Pembroke Dk. Yard	6 12	21	15½
Littlehampton -	11 36	16	11½	Benton Castle, } Cledau R. }	6 28	20	14½
Arundel (Bar) -	11 35	16	11½	Landshipping "	6 27	20	14½
Arundel (Town) -	12 25			LittleMilfordQuay,,	6 31	19	13½
Shoreham -	11 34	18	13½	Haverfordwest "	6 42	7½	2½
Brighton -	11 15	19½	16	Smalls Lighthouse -	6 0	21	
Newhaven -	11 51	20	15	Ramsay Sound -	6 0	17	
Beachy Head -	11 20	20	15	Fishguard -	6 56	11½	8½
Hastings -	10 53	24	17½	Newport -	7 0	12	9
Rye Bay -	11 20	22	17½	Cardigan -	7 1	12	9
Dungeness -	10 45	21½	19	New Quay -	7 30	15	
Folkstone -	11 7	20	16½	Aberystwyth -	7 31	13½	10
Dover -	11 12	18½	15	Aberdovey -	8 0	15	
Deal -	11 15	16	12½	Sarn-y-bwch Reef-	7 40	14	
Ramsgate -	11 44	15	12	Barmouth -	7 41	17	13½
<i>England and Wales, West Coast.</i>				Sarn Badrig -	7 30	13	
Scilly Isles -	4 30	16	12	Port Madoc -	7 30	17	
(St. Agnes) }				St. Tudwall Road -	7 45	14	
Scilly Isles -	4 27	16	12	Pwllheli -	7 46	13½	9½
(St. Mary) }				Bardsey Id. -	7 40	15	
Cape Cornwall -	4 35	18?	13?	Porth-dyn-lleyn -	8 30	16	
St. Ives -	4 44	21	15	Caernarvon -	9 33	13½	10½
Padstow -	5 13	20½	16½	Holyhead -	10 11	16	12½
Boscastle -	5 15	25	17½	Amlwch -	10 30	18?	13?
Budehaven -	5 45	23	17	Beaumaris -	10 32	21½	16½
Lundy Island -	5 15	27	20	Air Point, R. Dee	10 54	25	19
Barnstaple (Bridge)	6 28	10½		Chester (Crane } Wharf) - }	12 16	26	
Appledore -	5 58	23	16½	Liverpool -	11 23	26	20½
Bideford -	6 7	16		Formby Point -	10 35	28	
Ilfracombe -	5 42	27½	21½	Ribble Lighthouse	10 51	24	17
Linmouth, or the }				Preston -	11 49	10	4½
Foreland - }	6 2	30½	21½	Fleetwood (Wyre Lt)	11 11	27	20½
Minehead -	6 24	32½	24½	" (Port)	11 12	26½	19½
Bridgewater Bar -	6 50	35	26½	Lancaster -	11 16	8½	
Weston-super-mare	6 54	37	28½	Poulton-le-Sands -	11 26	27½	21½
Flatholm Islands -	6 54	37?	28?	Piel Harbour (Pier)	11 5	28	21
Walton Bay -	7 3	39½	22½	Whitehaven -	11 14	23½	18½
Portishead or }				Port Harrington -	11 5	26	19
King Road - }	7 13	40	31	Workington -	11 4	20	15
Bristol (Cumber- land Dock Gates) }	7 18	31½		Maryport -	11 3	18	13
Chepstow -	7 30	38	28½	Abbey Head -	11 10	23	17
Newport -	7 10	38	29	Southernness -	11 20	28	
Cardiff (Penarth) -	6 56	37½	29	Annan Foot -	11 56	20	14
Barry Island -	6 39	35½	26	Port Carlisle -	12 10	20	14
Nash Point -	6 25	33	25	Point of Ayr -	11 7	20?	16?
Swansea (Mum- bles Lighthouse) }	6 1	27½	20½	Douglas, I. of Man	11 12	20½	16
Porthcawl -	6 8	28½	21½	Ramsey "	11 12	19½	16
Burry Port -	6 1	25½	18½	Peel "	11 8	16½	13
				Calf Sound "	11 17	16½	13
				Port St. Mary "	11 10	20	16
				Castletown "	11 10	20	16

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Scotland, West Coast.					h. m.	ft.	ft.
Solway (Tarn Point)	11 22	23	18	Ballachulish, Head of Loch }	6 28		
Kirkcudbright	11 10	23		Corran, Loch Aber	5 43	12	8½
Newton Stewart }	12 0	12	6	Corpach	5 59	11½	
(Carty Quay) - }				Loch Eil (Head of }	6 27		
Wigton	11 30			Loch) - }			
Garliestown		17	12	Duart, I. of Mull	5 0	12	10
Port William	11 10	18	10	Loch Aline	5 33	13½	10½
Mull of Galloway	11 15	15?	12?	Tobermory, Mull I.	5 36	13	9½
Port Patrick	11 10	15	12	Loch Cuan	5 36	13	9½
Loch Ryan	11 12	11	8	Strontian, L. Sunart	5 40	13½	
Mull of Cantyre	10 35	4		Iona Sound	5 11	11½	8½
Campbellton	11 45	8½	6	Bunessan	5 24	12	8½
East Loch Tar-				Loch Tuadh (Go-			
bert,Argyleshire }	11 53	9		metra) I. of Mull }	5 29	11½	8
Lamlash	11 49	10	7	Scarnish, Tiree I.	5 31	12	9
Ayr	11 50	8½	7½	Arinagour, Coll I.	5 41	12½	9½
Troon	11 50	10	7½	Loch Moidart	5 44	13½	9½
Ardrossan	11 45	10	8	Eigg Island	6 15	14	10
Garroch Head	11 49	10		Arasaig	5 50	13½	10
Millport, Great }				Loch Nevis	5 47	14½	10
Cumbræ - }	11 50	10	6	Loch Hourn	5 45	13½	10½
Largs	11 50	10		Ornsay, I. of Skye	5 50	14½	10½
Greenock	0 8	9½	8½	Kyle Rhea	6 0	15	11
Port Glasgow	0 18	9		Loch Duich	6 0	15½	11
Dumbarton	0 20	9		Loch Alsh (Kyle }	6 16	15½	11
Bowling	0 39	9		Akin) - }			
Renfrew(CanalEnt.)	1 15	9		Loch Carron	6 29	16½	11½
Glasgow	1 25	9	7½	(Plockton) - }			
Loch Long	12 6	12		Portree, I. of Skye	6 32	15	10½
Loch Goil	12 6	10	6	South Rona, Light }	6 20	14½	10½
Loch Strivan	11 55	6		House - }			
Burnt Isles, Kyles }				Loch Torridon	6 20	16	11
of Bute - }	11 50	10	8	Barra, North Harb.	5 48	11½	8½
Skip Ness	11 50	9	6	" Castle Bay	5 44	11½	8½
Ardrihaig, L. Fyne	11 53	9	7½	" Head, Ber-	5 45	11½	7
Inverary	12 0	10		nera Id. }			
Gigha Sound	2 22	4	2½	Canna Island	6 19	14	9½
West Loch Tar-				Loch Boisdale, }			
bert,Argyleshire }	2 30	1-4		South Uist - }	5 47	12½	9½
Port Ellen, Islay	5 0	5	4	Benbecula	6 3	11½	8½
Jura, Feolin Ferry	4 41	6½	4½	Loch Skipport	5 52	12½	9
" Small Isles	5 3	3½	2½	Loch Dunvegan			
Criman	4 49	6½	5	(DunveganCas-	6 7	15½	11
Noamh Island	5 2	11½	7	tle, I. of Skye) }			
Colonsay (Schal-				Kallin, North Uist	5 59	13½	9½
lasaig) - }	5 18	11	7½	Monach Is. (Shillay)	5 44	12½	8½
Carsaig	5 28	10	7½	Loch Eport, N. Uist	6 6	12½	9½
Easdale Sound	5 10	10-12		Loch Maddy, N. Uist	6 6	12½	9½
Ardintallan, Loch }				Vallay	6 10	11½	8½
Feochan - }	5 31	9	6½	Berneray I. (Sound }	6 11	13	9½
Oban	5 22	12	9½	of Harris) - }			
Stonefield, Loch Etive	7 3			Obb of Harris	6 16	11½	8½
Bunawe	7 54	5½		East Loch Tar-	6 10	13½	10
Port Appin, Loch }				bert, Harris Id. }			
Linnhe - }	5 26	12½	8½	W. Loch Tarbert	6 4	11½	8½
Corran, Loch }				Loch Seaforth }	6 16	15	10
Linnhe - }	6 37	14½		(Athline) - }			
Ballachulish, }				Loch Clay	6 9	14½	9½
Loch Leven }	5 43	11		Loch Ewe(Poolewe)	6 39	14½	10½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Loch Broom } (Ullapool) - }	6 40	14½	10½	Stonehaven -	1 10	14	11
Gruinard Id. -	6 37	14½		Montrose -	1 25	13	10
Tanera, Summer I. -	6 37	14	10½	Arbroath -	1 35	14	11
Loch Inver -	6 40	14	11	Tay River (Bar) -	2 6	16	14
Loch Harport -	5 54	13½	10	Broughty Ferry -	2 22	14½	11
Loch Erisort, } Lewis Id. - }	6 43	15½	11½	Dundee -	2 32	14½	11½
Stornoway -	6 46	13½	9½	Perth -	3 35		
Loch Roag (Bernera) Lewis I. - }	6 11	11	8	Cockenzie, Firth of } Forth - }	2 16	15½	13
St. Kilda -	5 30			Leith -	2 17	16½	12½
Rockall -	3 30	12		Granton Pier -	2 20	16	12½
Loch Laxford -	6 44	15	11½	Burntisland -	2 24	16½	12½
Cape Wrath -	7 30	15½		Queensferry -	2 37	18	14
Loch Eriboll -	7 43	14½	11	Kincardine -	2 53	17½	15
Loch Tongue -	7 53	15	12	Alloa -	3 18	17½	15
Thurso -	8 28	13½	9½	Stirling -	3 52	7½	4½
Stroma, S. side -	9 47	7½	6	Dunbar -	2 8	14½	11
Swona, E. side -	10 24	10	7½	Eyemouth -	2 15	15½	11½
" W. side -	9 35	10	7	Berwick -	2 18	15	11½
Great Skerry, } E. side - }	11 4	7½	6½	<i>England, East Coast.</i>			
" W. side -	10 53			Holy Island Harb. -	2 30	15	11½
<i>Orkneys.</i>				North Sunderland -	2 30	15	11½
Widewall (South Ronaldsha) - }	9 3	10	7½	Coquet Road -	3 0	14½	11
Stromness (Mainland) - }	9 0	10	7½	Blyth -	3 15	15	11
Scapa -	9 5	10	7½	Tyne River (Bar) -	3 20	14½	11½
Deer Sd. (Mainland) - }	10 30	10	7½	" North Shields } (Low Lt. Hse.) }	3 23	13½	10
Kirkwall -	10 9	10	7½	" Howden -		12	
Westness (Rowsa) -	9 11	10	7½	" Walker -		10½	
Otterswick (Sanda) -	9 13	11	8	" Newcastle -	4 23	10½	
<i>Shetland Isles.</i>				Sunderland -	3 22	14½	11
Fair Isle -	11 0	5	3	Seaham -	3 24	14½	10½
Sumburgh Head } (Mainland) - }	9 45			Hartlepool -	3 28	15	11½
Sealloway -	9 30	5½	4½	Tees River, Bar -	3 45	15	12½
Hillswick, or Urie } Firth (St. Magnus Bay) - }	9 45	6½	5	" Middlesbrough -	3 55	13	10½
Lerwick (Mainland) -	10 30	6	4	" Stockton -	4 40	11	
Balta (Unst) -	9 45	6	4½	Whitby -	3 45	15	11½
<i>Scotland, East Coast.</i>				Scarborough -	4 11	15½	12½
Duncansby Ness -	10 14	8½	6	Filey Bay -	4 20	16	12½
Vick -	11 22	10	7½	Flamborough Head -	4 30	16	12
Loch Fleet -	0 22	10½		Bridlington -	4 39	16	12
Dornock Road -	11 47	11		Humber River, } Spurn Point - }	5 26	18½	15
Orromarty -	11 56	14	11	" Grimsby -	5 36	19½	15
Inverness (Kellock Pier) - }	12 18	12	9½	" Killingholme -	6 2	19½	15½
Caniff -	0 28	10½	8	" Hull -	6 29	20½	16½
Fraserburgh -	0 40	11	8½	" Ferriby Sluice -	6 41	20½	
Peterhead -	0 34	10½	8½	" Blacktoft -	6 59	16	
Than River -		9½		" Goole -	7 26	13	
Berdeen -	1 0	12	10	Boston Deep, Clay } Hole - }		21½	
				" Hob Hole -		17	
				" (Sluice) -	7 0	12	
				Lynn Deep, Long } Sand - }	6 0	23	
				" Lynn Road -		20	
				" Lynn -		18	
				Wisbeach Eye -		20	
				Sutton Bridge -		18	
				Wisbeach -	7 30	15	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wells Bar -	6 20	18		Gravesend -	1 10	17½	14
Wells -	7 0	12		Woolwich -	1 37	18½	15½
Blakeney Bar -	6 30	15		Greenwich -	1 43	19	15
Blakeney -		9		London Docks -	1 57	20½	17½
Cley -		5½		London Bridge -	2 7	20½	17
Cromer -	7 0	14½	11				
Leman Shoal -	6 0			<i>Ireland, South and East Coasts.</i>			
Ower Shoal -	6 30			Cape Clear -	4 0	9	6½
Hammond Knoll -	7 40			Baltimore -	4 23	10½	8½
Winterton Ness -	8 25	7½	6½	Castletownsend -	4 21	10½	8
Yarmouth Road -	9 15	6	4½	Clonakilty Bay -	4 30	11	8½
" Haven, Brush		5½	4½	Courtmacsherry -	4 36	10½	8½
" Bridge		5	4	Kinsale -	4 43	11½	9
Lowestoft -	9 57	6½	5½	Queenstown -	5 1	11½	9
Blyth River, South	10 20	6½	4½	Cork, (Penrose	4 58	12½	10
wold -				Quay) -			
Aldborough -	10 45	8?	6½?	Ballycotton -	4 54	12	9½
Kentish Knock -	11 47			Youghal -	5 14	12½	10
Orfordness -	11 15	8	6½	Ballinacourty,	5 12	12½	9½
Hollesley -	11 30	8?	6?	Dungarvan -			
Orford Haven Bar	11 30	7½		Dunmore -	5 27	12½	9½
Orford Quay -	12 36	7½		Waterford (Dun-	5 20	12½	10
" Slaughden -	1 0	7½		cannon Fort) -			
" Snape Bridge	3 0	6		— (Bridge) -	6 6	13½	10½
Woodbridge or	11 45	12	9	New Ross -	6 4	12½	10
Bawdsey				Saltees -	5 40		
Haven Bar				Wexford -	7 21	5	8½
" Kingston Quay	12 35	10		Kilmichael Point -	8 30	4½	3
" Wilford Bridge	12 55	7		Arklow -	8 45	4	3
Harwich Harbour	12 6	11½	9½	Wicklow -	10 29	9	6½
Orwell River, Pin-	12 20	12		Bray Head -	10 45	12	9½
mill -				Dalkey Island -	10 45	13	11
" Downham	12 27	12		Kingstown -	11 10	11	8½
Reach -				Dublin Bar (Pool-	11 12	12 - 14	9 - 11
" River,	12 35	13½		beg Lt. House) -			
Ipswich -				Howth Harbour -	11 9	13	10
Stour River,	12 29	12		Malahide Inlet -	11 15	10	8
Wrabness -				Rogerstown Inlet -	11 15	10½	8
" Mistle Quay	12 48	11½		Skerries Islands -	11 0	13	10
" Cattawade	1 8	4½		Balbriggan -	10 40	11	
Bridge -				Drogheda (Bar) -	11 0	11½	9
The Naze -	12 6	12½	10	Dundalk -	10 56	13½	11½
Colne River, Colne	12 0	14	10	Greencastle Point	11 2	14	11½
Point -				Carlingford (Bar) or	11 0	14	11
" Wivenhoe -	12 10	15	10½	Cranfield Point.			
Blackwater River,	12 0	14½	10	" Warrenpoint -	11 10	14½	12
Scales Point -				Newcastle -	11 4	14½	12
" Heybridge -	12 20	12	8	Ardglass -	11 0	16	12
Chelmer River,	12 32	10	6	South Rock -	10 58	13	10½
Maldou -				Lough Strangford	10 53	14	11½
Gunfleet Sand, N.E.	11 40	12	8	(Killard Point) -			
end -				" Strangford	12 31	10½	8½
Crouch River,	12 5	14½	10½	Quay -			
Foulness -				" Quoile Quay	12 45	11	9½
" Hull Bridge	12 25	16	11	" Kircubbin	12 42	11½	9½
Maplin Light -	12 5	14½	10½	" Killyleagh	12 40	11	9½
Margate -	11 40	15½	13	Head of the Lough	12 44	11½	9½
Pansand Hole -	2 0	15½	13	(Turley Rocks) -			
Nore -	12 30	15½	13				
Sheerness -	0 37	16	13½				
Chatham -	1 11	18	14½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Ireland, West Coast.				Ireland, North and East Coasts.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape Clear - -	4 0	9	6½	Ballyshannon (Bar)	5 18	11½	8½
Skull - -	4 2	9¾	7½	Donegal Harbour } (Salthill Quay)	5 18	11½	8½
Crookhaven - -	4 9	9¾	8	Teelin Harbour -	5 16	11½	8½
Dunmanus Harbour	3 57	9¾	7½	Killybegs - -	5 16	11½	8½
Dunbeacon -	3 51	10½	7½	Lough Rossmore -	5 20	11	8
Black Ball Harbour	3 40	9½	7½	Rutland Island -	5 22	11	8
Castletown, Bear- haven - - }	4 14	9¾	7½	Gweedore (Bunbeg)	5 32	11	8
Bantry Harbour -	3 47	10	7½	Ireland, North and East Coasts.			
Kenmare R., Bal- lycrovane }	3 42	10½	7¾	Ballyness (Bar) -	5 22	11½	8½
„ Dunkerron	3 45	10½	8	Sheephaven -	5 32	11½	8½
„ Ormond -	3 43	10	7½	Mulroy Bay, (Bar)	5 40	11½	8½
„ West Cove	3 52	10	7½	„ Fanny Hole -	6 17	9½	8
Ballinskellig Bay -	3 40	12	7½	„ Seamount Bay	6 44	7½	
Valentia Harbour -	3 42	11	8	„ Cranford Bay	8 3	4	2½
Ventry - -	3 44	10½	7¾	Rathmullan, Lough }	5 42	12½	9
Blasket Islands -	3 30	11½	8	Swilly - - }	6 10	11½	8½
Dingle - -	3 51	10½	7¾	Trawbreaga Lough	5 49	10½	7½
Smerwick -	3 50	11½	8	Slievebane Bay -	5 53	8½	6
Tralee Bay (Fenit)	4 3	12½	9½	Culdaff Bay -	6 20	6½	5
R. Shannon, Kil- baha - }	4 16	13	9½	Warrenpoint, }	7 6	7½	5½
„ Kilrush -	4 42	14	10½	Lough Foyle - }	8 1	7½	5½
„ Carriga- }	4 44	14	10½	Londonderry -	6 24	6½	4
„ holt - }				Coleraine - -	6 8	5½	3½
„ Tarbert -	4 57	14½	10½	Port Rush - -	6 15	5	3
„ Foynes Id.	5 35	15½	12	Skerries - -	6 25	8	2
„ Mellon -	6 1	18½	13¾	Ballycastle Bay	10 31	4	4
„ Limerick	6 16	18¾	13¾	Red Bay (Pier) -	10 51	5½	5
Liscanor Bay -	4 23	13¾	10	Cairnlough - -	10 43	6½	6½
Mutton Island -	4 20	13¾	9½	Maiden Rocks -	10 48	6½	6½
Galway - -	4 35	14¾	11	Lough Larne -	10 43	9½	8
Killeany, Arran Ids.	4 28	13½	10	Belfast - -	11 13	11½	9½
Cashla Bay -	4 33	16	12	Donaghadee -	10 58	13	10½
Kilkieran Cove -	4 34	15½	11	South Rock -	10 53	14	11½
Greatman Bay -	4 39	15½	11½	Lough Strangford }			
Roundstone -	4 28	13½	10½	(Killard Point)			
Slyne Head - -	4 30	13½	10				
Clifden Bay - -	4 30	13½	10				
Ballynakill Bay -	4 40	12½	9½				
Inishbofin - -	4 34	12½	9½				
Inishturk - -	4 36	12½	9½				
Clare Island -	4 38	12½	9½				
Westport - -	4 57	12¾	9½				
Achillbeg - -	5 14	10¾	8				
Bulls Mouth, }							
(N. entrance of }							
Achill Sound) - }	5 38	10¾	7½				
Blacksod Bay }							
(Quay) - - }	4 47	10	8½				
Broadhaven Harb.	5 0	10½	7½				
Killala Bay -	5 22	10½	8				
Sligo Bay, (Mul- laghmore) - }	5 18	11½	8½				
Ballysadare (Quay)	6 0	8¾	5½				
Sligo Harbour }							
(Oyster Island) }	5 23	11½	8½				
				France, North Coast.			
				Ushant - -	3 32	19½	13½
				Abervrach - -	4 14	22	16
				Ile de Bas - -	4 49	23	17
				Roscoff - -	4 46	23	17½
				Morlaix Road -	4 53	24	18
				Ploumanach -	5 15	24½	18½
				Ploughrescan -	5 17	25½	18½
				Tréguier - -	5 32	25	18½
				Héaux Lights -	5 45	31	23½
				Bréhat - -	5 51	31	23½
				Paimpol - -	6 0	31	23½
				Portrieux - -	6 0	31	23½
				Binnic - -	6 3	30	23½
				Dahouet - -	6 5	32	23½
				Erqui - -	5 59	33½	24½
				St. Malo - -	6 5	35	26
				Les Minquiers -	6 6	35	26
				Cancale - -	6 20	37	27
				Iles de Chansey -	6 9	35	26

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Granville -	6 13	37	27½	Nieuwediep -	7 27	4	3½
Régneville -	6 20	35	26	Terschelling(West)	8 40	6	5
St. Germain -	6 20	34	25	Ameland Gat -	9 0	7	
Carteret -	6 25	31	22½	„ Hollum Rd.	11 30	7	
Ecehous -	6 32	31	22½	Ems (outer buoy) -	10 0	8-10	
Jersey, Rosel -	6 15	30	21½	Borkum (road) -	10 30	8-10	
„ St. Helier -	6 29	31½	28	Delftsyl -	11 15	8-10	
Diélette -	6 40	27	20½	Emden -	12 0		
Goury -	7 6	22	17½	Norderney -	10 30	8	
Omonville -	7 29	15½	12½	Weser, outer light	11 30		
Guernsey (St. } Peter Port) - }	6 37	26	18½	vessel - }			
Casquets -	6 45	15½		Wanger Oog -	12 0	9½	
Alderney -	6 46	17½	12½	Helgoland -	11 33	9½	7
Cherbourg -	7 49	17	12½	Elbe, entrance -	12 0	11	
Barfleur -	8 51	17	13½	„ Cuxhaven -	1 8	10	
La Hougue -	8 42	18½	14½	„ Brunsbittel -	1 58	9	
St. Marcouf Is. -	9 55	20		„ Gluckstadt -	3 9	10	
Port-en-Bessin -	8 57	20	15½	„ Altona -	5 19	7	
Courselles -	9 7	20	15½	Elbe, Hamburg -	5 29	6½	
Oystreham -	9 38	21	16	Eider, Tonning -	2 1	9	
Merville -	9 36	21	17½	„ Friederich- }	2 37	9	
Dives -	9 39	21	16	stadt - }			
Honfleur -	9 29	23½	18	Eider, Rendsborg -	7 42	4	
Quilleboeuf -	10 6	9½	7½	Husum -	2 36	9	
Caen -	10 57			List -	2 21	6	
Hâvre -	9 51	22	18	Hierting -	2 45	5	
Rouen -	2 28			Nyminde Gab -	2 41	2	
Fécamp -	10 44	23½	18	Thorsminde -	3 34	2	
St. Valery-en-Caux	10 46	27	21½	Blaavand or Horn }	1 44	5	
Dieppe -	11 6	27	20½	Point - }			
Tréport -	11 9	27	21	Aggerminde -	4 9	2	
Cayeux -	11 5	27½	21	Hirtshals -	4 28	1	
Hourdel -	11 26	27½	21	Skagen or the Skaw	5 56	1	
St. Valery-sur- }	11 46	27	21½	Bergen -	1 30	4	
Somme. }				Romdals Islands -	10 45	6	
Boulogne -	11 25	25	19½	Ramso Fiord -	10 45	7	
Cape Grisnez -	11 27	21½	16½	Oxbaasheia, Svee }	12 0	8	
Calais -	11 49	19½	15½	Fiord - }			
Gravelines -	12 0	19	15	Træ Islands -	11 45	7	
Dunkerque -	12 8	16½	13½	Værø -	12 0	9	7½
				Lofoten Islands -	12 0	9	7½
				Tromsø -	1 45	8	
				Hammerfest -	1 10	9	
<i>North Sea, East Coast.</i>				<i>Færoe Islands.</i>			
Nieuport -	12 18	16	13	Fugloe Fiord -	11 15	6½	4½
Ostend -	12 25	19	15	Svineo Fiord -	12 0	6½	4½
Blankenberg -	12 48	13	11	Leervig Fiord -	0 30	6½	4½
Bathz -	3 15	15		Miaveness -	3 12	6½	4½
Flushing -	1 20	15		Naalsoe Fiord -	4 0	6½	4½
Antwerp -	4 25	15		SkaapenFiord(be- }	5 0	9½	7½
Veere -	1 20	15		tween Stormoe }			
De Roompot -	12 30	12	8	and Sandoe) - }	5 30	9½	7½
Zieriksee -	2 0	11	9	„ (betweenHestoe }			
Brouwershaven -	2 15	10	8	and Sandoe) - }	6 0	9½	7½
Goeree (West Gat)	1 45	7		Waagoe Fiord -			
Hellevoetsluis -	2 30	8	6	Westmanshaven -	8 0	9½	7½
Brielle -	8 0	5		Suderoe Fiord -	6 0	9½	7½
Rotterdam -	3 45	7		Myggenæs Fiord -	9 0	9½	7½
Katwyk -	2 30	5		Eides Fiord -	11 0	9½	7½
Texel(outside shoals)	6 30	4	3½				
Kykduin -	7 0	12					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Iceland.				Africa, West Coast. (From Cape of Good Hope to the Northward.)			
Reikiavik - -	h. m. 5 0	ft. 17½	ft. 13½	Simons Bay -	h. m. 2 44	ft. 5½	ft. 3½
Lapland.				Hout Bay -	2 20	5	
Liza Bay - -	5 58	9		Table Bay -	2 40	5	
Nova Zembla Harb.	6 36	10		Saldanha Bay -	2 0	6	
Jekatarina Islands	6 23	10		St. Helena Bay -	2 30	6	
Kildin Island -	6 45	12		Roodewall Bay -	2 30	6½	
Habitable Island, }	7 9	9		Hondeklip Bay -	2 30	5½	
Seleney Bay - }				Mc. Dougall Harb.	2 30	5½	
Teriberka River -	7 20	12		Port Nolloth -	2 30	5½	
Olenji Islands -	7 30	12		Elizabeth Bay -		5 - 6	
Charlowka River -	8 8	12		Angra Pequena -	2 30	8	
Seven Islands -	8 20	12		Ichabo Island -	1 0	6	4
Jukan Islands -	9 0	13		Spencer Bay -	10 50	5 - 6	
Sviatoi Nos -	9 15	14		Port d' Ilheo -	3 0	8 - 10	
White Sea.				Walvisch Bay -	1 54	6	
Inkanskie - -	9 15	14		Port Alexander -	3 0	5	
Turna Bay - -	9 54	11		Great Fish Bay -	2 30	5 - 6?	
Trek Island -	10 48	20		Little Fish Bay -	2 30		
Litke Bank -	11 45	15		Torta Bay -	3 30	3	
Cape Kanushin -	11 54	15		Benguela -	3 45	5 - 6	
Sosnovets -	11 44	18		Lobito - -	4 15	5 - 6	
Morjovets I. -	11 20	17		St. Helena Island -	3 11	3	
Cape Voronov -	11 20	17		Ascension Island -	5 30	2	
Intsi Point -	11 55	16		San Paul de Loanda	4 30	5	
Kouloi River -	1 15	20		River Congo -	4 30	6	
Mezen - -	1 48	15 - 22		Black Point Bay -	4 30	6	
Kerets Point, Gulf }	4 30	5½		Loango Bay -	4 30	6½	
of Arkhangel - }				Mayumba -	4 35	7	
Nikolskoi Tower „	6 0	2		Cape Lopez -	4 30	4 - 6?	
Moudinga I. „	5 50	3½		River Gaboon -	5 30	7	5
Dvina Bar -		3½		Corisco Bay }	5 0	7	
Arkhangel „	7 28	2½		(Elobey Isles) - }			
Nikolskoi Chan. „	5 25	3		Banoko - -	5 24	5	
Gribanika Pt. „	4 50	3		Anno Bom Id. -	3 45	5	
Jijginsk I. -	5 15	4		St. Thomas Id. -	3 25	4½	
Cape Orlov Letni, }	5 18	4		Princes Id. -	3 45	4½	
Gulf of Onega - }				Fernando Po -	4 0	7	
Onega River -	9 17	6 - 7		Cameroon River -	4 0?	6	
Souma - -	6 30	5½		Bonny and New }	5 0	9	
Solovet Road -	5 0	4		Calabar Rivers- }			
Kyem River -	5 23	4		Brass River -	4 0	6	
Kalgalaksha -	6 50	7		River Niger, Nun }	4 8	6	
Keret, Gulf of }	3 8	6		(entrance) - }			
Kandalak - }				„ Middleton -	4 15	5	
Kovda Bay -	3 25	6		„ Pennington -	4 15	5	
Kandalaksha „	3 25	7		„ Dodo -	4 17	5	
Sosnovaia Bay „	2 40	6		„ Ramos -	4 20	5	
Kou Zomen -	3 30	6		„ Forçados -	4 22	5	
Tetrina -	3 17	7		„ Benin -	4 30	7	
Nova Zembla.				„ Lagos (Bar) -	6 0	3	
Hakluyt Head -	1 30	4		„ „ Consulate }		2	
Spitzbergen.				Wharf }			
Bell Sound - -	8 56	3½		„ Palaver Ida. -		1	
Danes Id., South }	0 24	5½		Cape Coast Castle -	4 30	6	
Gat - - }				St. George d'Elmina	4 30	6	
				Cape Three Points-	4 0	4	
				Axim -	4 30	4	
				Grand Lahou -	4 20	4	
				Tabou River -	4 45	3 - 4	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape Palmas -	4 30	4		Tunis (Goletta) -		3	
Sinou -	5 0	4		Sphax Roads -	4 30	5	3
Sangwin River -	5 15	4		Jerba -	3 10	7	5
Grand Cestos -	5 20	4		Malaga -	12 0	3	
Edina -	5 50	4		Yafa (Syria) -	10 0	1½	
Junk River -	5 45	5		Tripoli -	10 20	2	
Monrovia -	6 0	6		Lissa (Adriatic) -	4 10	2½	
Gallinas River -	6 45	4		Trieste -	9 35	3½	
Gilmorris Id. }	6 0	11		<i>Europe, West Coast.</i>			
Sherbro River- }				Gibraltar, old Mole	2 20	3½	
Edmonstone Id. "		8		Algeçiras -	1 49	4	2½
Bagroo River "		11		Tarifa -	1 46	6	3½
Banana Islands -	8 15	9		Cadiz -	1 45	9½	
Sierra Leone -	7 55	8		Rota -	1 24	12½	8
Yellaboi Island -	7 10	10		Salmedina Rocks -	1 27	12½	8
Scarcies Rivers -	7 10	10		Chipiona -	1 34	12½	8
Mellacoree R. -	7 40	11		San Lucar -	1 53	12½	8
Forecarreah R. -	7 40	11		Bonanza -	2 0	12½	8
Mahneah R. -	7 40	11		Conil -	1 18	11½	7½
Isles de Los -	6 35	13		Lagos -	2 7	13	
River Ponga -	7 30	12	9½	Setubal -	2 30	8	
" Nunez -	10 0	15	11½	Lisbon (Belem) -	2 30	12	9
" Componee -	10 0	15	11½	Peniche -	1 54		
Bijouga Ids., Or- }	10 0	11		Mondego (Bar) -	2 30	7	
ango Channel - }				Oporto -	2 30	10	
" Arcas }	10 10	11 - 14	9	Fayal, Azores -	11 45	4	
Channel - }				Terceira -	12 32	4½	
" Bissao-	11 0	8		St. Michael -	12 30	6	
River Cacheo -	7 45	8		Funchal Bay, Ma- }	12 48	7	
" Gambia -	8 10	6 - 9		deira - }			
Joombas River -	8 10	6		Vigo -	3 0	12 - 13	
Salm River -	8 10	6		Cape Finisterre -	3 0		
Goree -	7 45	2½		Port Camariñas -	3 0	15	
Senegal (Bar) -	8 42	6		Corunna -	3 0	15	
----- (Guet }	8 42	6		Ferrol -	3 0	15	
N'dar) - }				Cedeira -	3 0	15	
----- (St. Louis)	10 0	6		Vivero -	3 0	15	
Sal, C. Verde Ids.	7 45	5		Rivadeo -	3 0	15	
Porto Praya -	6 0?	5		Barquero (entrance)	3 0	15	
Portendik -	10 0	6		Gijon Bay -	3 0	14	11
Levrier Bay -	12 0	6 - 7		St. Martin de la }			
Ouro River -	12 0	8 - 9		Arena - }	3 30	15	
Cape Blanco -	11 46	6		Santander -	3 30	15	12
Cape Bojador -	12 0	8?		Santona -	3 30	12½	10½
Cape Juby -		8		Bilbao (Bar) -	3 0	13	
Ferro, Canary Ids.	12 30?	9?		Olaveaga -	3 15	12	
Palma -	12 30?	9?		Bilbao (Town) -	3 20	9	
Gomera -	12 45?	9?		St. Sebastian -	3 0	12	9
Lanzarote -	1 0?	9?		Port Pasages -	3 0	12	9
SantaCruz, Tenerife	1 30	8	6	Socoa -	3 19	12½	8
Puerto de la Luz, }	12 52	10		Bayonne (Bar) -	3 45	12	10½
Gran Canaria - }				Boucant, Adour R.	3 39	8½	6
SantaCruz or Agadir	12 45	9		Arcachon -	4 37	11½	9½
Mogador -	1 18	10 - 12		Cordouan Lt. house	3 37	13½	10½
Cape Cantin -	10 0	10		Royan -	3 38	13½	10
Rabat -	1 46	9 - 12		St. Surin -	4 11	14½	11
El Araish -	1 30	9 - 12		Bordeaux -	6 50	14	12½
Tangier -	1 42	8		Iled'Aix, Charente }			
<i>Mediterranean.</i>				R. Entrance - }	3 20	17	12½
Centa -	2 6	3½	2½				
Tetuan -	2 23	2½	1½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Ile d'Oleron -	3 50	19		Port Edgar -	7 15	6	
Rochefort -	4 6	17	13	Fox Bay -	7 0	6	
Rochelle -	3 31	17	13	Manybranch Harb. -	7 40	7½	
Les Sables d'Olonne -	3 26	14	10	Port Egmont -	7 30	11	
Seudre River (en- trance, - }	3 31	15	11½	Hope Harbour -	8 10	7	
Ile d'Yeu -	3 6	14½	10	Shallow Harbour -	9 30	6	
Ile de Noirmoutier -	3 2	16	11½	Ship Harbour, New Island - }	10 30		
Port Navallo -	3 42	13	9½				
St. Nazaire -	3 10	15½	11				
Port le Palais, } Belle Ile - }	3 18	14½	10½				
Port Louis, L'Orient -	3 11	13	9½				
Concarneau -	3 12	13	9½				
Penmark Rocks -	3 16						
Glenan Is. -	3 12	13	10				
Ile de Sein -	3 21	17½	12				
Brest -	3 47	19	13½				
Conquet Road -	3 46	21	15				
Ushant -	3 32	19½	13½				
<i>South America, East Coast.</i> <i>(Cape Horn to the Northward.)</i>				<i>South America, East Coast—continued.</i>			
St. Martin Cove, } Cape Horn Ids. }	3 50	8		Port Gallegos -	8 50	46	
Cockburn Island } (Antartic Ocn.) }	7 50	6		Coy Inlet -	9 30	40	
Cape Peñas -	6 42	12		Santa Cruz River -	9 30	40	29
Cape San Diego -	4 30	10		Port San Julian -	10 45	30	
Orange Bay -	3 30	6		" Desire -	12 10	18½	
Goree Road -	4 0	8		" Melo -	3 40	15	
Le Maire Strait -	4 0	7		" Santa Elena -	4 0	17	
Staten Island -	4 30	8		Nuevo Gulf -	7 0	10	
San Sebastian Bay -	7 0			Port San Josef -	10 0	30	25
				Sea Bear Bay -	12 45	20	
				Port San Antonio -	10 45	18-30	
				Rio Negro -	11 0	14	10
				San Blas (Rubia Head) - }	1 30	12	10
				Colorado River -	4 0	9	7½
				Union Bay -	3 10	12	9
				Port Belgrano -	6 0	12	10
				Tristan da Cunha -		8	
				*Riodela Plata, (C. Castillos) }	8 30	2	
				" Buenos Ayres	12 0	3-5	
				" Barragan Bay	7 0	5-9	
				Rio Grande do Sul		1½-2	
				Santa Catharina I.	2 45	6	4½
				San Sebastian -	2 0	4	
				Ilha Grande (Es- trella Bay) - }	12 30	5	4
				Rio Janeiro -	3 0	4	3
				Porto Frio -	2 40	4½	
				Macahé -	2 30	9½	
				Benevente -	3 0	5	
				Espirito Santa Bay, and Port }	3 0	4	
				Victoria - }			
				Abrolhos -	3 20	6-7	
				Martin Vas Rocks	3 45		
				Os Ilheos -	4 30		
				Bahia -	4 15	8	
				Maceio -	4 30	8½	
				Pernambuco -	4 45	8	6
				Parahiba -	5 0	9-12	
				Cape St. Roque -		8-10	
				Rocas -	5 15	10	
				Fernando Noronha	4 0	6	
				Aracati -	6 0	8	6
				Ceara -	4 30	9	
				Jericoacoara -	11 30	12	9
				Maranham -	7 0	16½	10½
				San Joao -	6 24	14	
				Para -	12 0	11	10½
<i>West Falkland.</i>							
Port Stephens -	7 45	7½					
" Albemarle -	7 15	7					

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cayenne River -	3 45	6-11		Hanover Sound -	8 15	4	3
Maroni River -	5 30	8		Douglas Road -	8 30	4	2½
Surinam -	6 0	5½		Abaco -	8 0	3	
Corentyn River -	5 10	8½	6	Man-of-War Cay -	8 10	4	
Berbice -	4 30	8-10	6	Gun Cay -	8 30	3	
Demerara River -	4 45	9	6	Memory Rock -	7 50	3	
Orinoco R. (entr.)	6 0	8		Bluff Cay -	7 0	4½	
Chacachacare Id.,	3 30	4		Puerto de la Plata,	7 30	3?	
Trinidad }				St. Domingo }			
Dragons Mouths }	3 30	4	2½	Mancenille Bay -	7 0	4-5?	
(Boca Grande) „ }				Fort Dauphin -	7 0	5½	3½
„ Boca Monos „ }	3 50	4	2½	Cape Haiti, St. }	6 0	3	
Chaguarama Bay „ }	4 20	4	2½	Domingo }			
Port of Spain „ }	4 30	4	2½	Lacul Harb. „ -	6 0?	3?	
San Fernando „ }	4 38	5	3	Gonaives Bay „ -	8 0?	1?	
Icacos Point „ }	4 14	7	4	Bay of St. Mark „ -	8 0?	1?	
Tobago -	3 0	4	2	Port au Prince „ -	8 0?	1?	
Cartagena -	11 0	1½	1	Caimites „ -	8 0?	1?	
Caledonia Harbour	11 40	1½	1	Bay of Aux Cayes „	uncertain	2-3?	
<i>Caribbean Sea and the Bahamas.</i>				Flamand Bay „ -	„	2-3?	
St. Vincent }	3 0	1½	1	St. Louis Bay „ -	„	2-3?	
(Kingstown) - }				Aquin Bay „ -	„	2-3?	
Grenada, (St. }	2 40	1½	¾	Jacmel „ -	„	2-3?	
George Harb.) }				Havana, Cuba* -	8 14	3	
Grenadines -	3 0	1½	1	Boca de Varadero „ *	8 39	2	
Barbados -	irr.	2		Baracoa „ *	7 23	2½	
Martinique(Robert }		4-5		Puerto de Mata „ *	6 49	2½	
Harbour) - }				Santiago de Cuba „ *	8 33	2½	
English Harbour, }		2		Playa de Incia „ *	7 31	2½	
Antigua - }				Puerto de Baiti- }	9 7	2½	
Anegada -	9 0	1½		queri „ *			
Gorda Sound, }	8 30	1½		Puerto de Maravi „ *	7 56	2½	
Virgin Island - }				Puerto de Taco „ *	8 49	2½	
Tortola -	8 30	1½		Cape St. Antonio „		1½	
Culebra or Pass- }	9 0	1		Port Royal, Jamaica	11 0	1	
age Island - }				<i>Bermudas.</i>			
Christianstæd, }	7 30	¾		Ireland Id. Dock }	7 14	4	
Santa Cruz - }				Yard - }			
San Juan, Porto }	8 2	1½		<i>North America, East Coast. (Isthmus of Panama</i>			
Rico - }				<i>to the Northward.)</i>			
Saintes -	6 45			Greytown -	9 0	1½	
Inagua -	8 0	3½	2½	Blewfields -	1 50	2	
Mira-por-vos -	9 30	3	2½	Corn Islands -	1 45	2	
Turks Islands -		3		Colombilla Cay, }			
Stirrup Cays -	7 0	4		Pearl Cays - }	2 0	2	
Crooked Island -	7 0	2½		Cape Gracias Harb.	10 30	2	
Exuma -	7 20	2½		Royal Harbour, }			
Royal Island -	7 45	3½		Ruatan - }	7 45	3½	
ClarenceHarbour, }	8 30	4	3½	Serranilla Bank -	irr.	2	
Long Island - }				Serrana Bank -		2	
Rugged Island -	8 0	3		Old Providence -	irr.	1	
Mucaras Reef -	7 40	3		Bonacca Island -	9 0	1½	
Lobos Cay -	7 40	3		Mugeres Harbour	9 30	1½	
Guinchos Kay -	7 40	3		Cozumel -	8 30	1½	
Nassau, New Pro- }	7 30	4	3	Cape Catoche -	9 30	1½	
vidence - }				Campeche -	1 45	2½	2
S. W. Bay „ -	7 30	4		Sisal -		2	
Salt Cay Anchorage	8 15	4	3				

* From the Anuario de la Direccion de Hidrografia, Madrid, 1863.

Place.	High Water Full and Change.	Rise.		Place.	High Water Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Laguna de Terminos	noon	1½		Cape Fear River } (Smithville)* -	7 19	5½	4½
Triangles - -		1½		Bald Head* - -	7 26	5	4½
Arcas Rocks - -	noon	1½		Port Royal Sound*:			
Vera Cruz - -		2		Entrance - -	7 16	7½	6½
<i>United States.</i>				Beaufort - -	7 26	3½	2½
<i>(Texas, Louisiana, Mississippi, Florida, Georgia, and S. & N. Carolina.)</i>				Ocracoke Inlet* -	7 4	2½	2
				Hatteras Inlet* -	7 4	2½	2
				<i>(Chesapeake Bay and Rivers.)</i>			
Brazos R. (entr.)*	irr.	1½		Cape Henry - -	7 40	4	
St. Luis Pass, Texas*		1½	¾	Cape Charles - -	7 45	5	
Galveston - -		1½	¾	Old Point Comfort*	8 17	3	2½
Sabine Pass* - -		1½		James R., City Point*	2 11	3	2½
Calcasieu River* -		2½	1½	Richmond* - -	4 28	3½	2½
Vermilion Bay } (entrance)* -	irr.	2½	1½	York R. (Moody's Wharf) - -	9 35	3½	
Atchafalaya Bay* -	irr.	2 - 2½		Piankatank River } (Cherry Point) -	10 5	2	¾
Timballier Bay* -	irr.	2		Tappahannock* -	0 42	2	1½
Barataria Bay } (entrance)* -	irr.	1½		Rappahannock } (Saunders Wharf)	3 2	2½	2
Mississippi S.W. pass		1½	¾	Point Lookout* -	12 58	2	1½
Biloxi* - -	irr.	2		Patuxent River* -	1 16	2	1½
Mobile - -	irr.	1 - 2		Annapolis* - -	4 38	1	1
Pensacola - -		1½		Chester R. (Rock-hall Creek)* -	5 23	2½	1
St. Andrews Bay* -	irr.	1 - 2		Patapsco River } (Bodkin Point)*	5 42	1½	1
St. Georges Sound } (west entrance)*	irr.	2½ - 4		Baltimore* - -	6 33	1½	1½
(middle entr.)* }	1 31	1½	1½	<i>(Delaware Bay and River.)</i>			
Apalachicola Bay -		2½ - 4		Cape Henlopen - -	8 0	4½	
St. Marks* - -	1 14	3	2½	Delaware Break- } water* - -	8 0	4½	3½
Cedar Cays* - -	0 51	3½	2½	Higbees, Cape May*	8 33	6½	5½
Tampa Bay* - -	11 21	1½	1½	Egg Island Light*	9 4	7	5½
Tortugas* - -	9 56	1½	1	Mahons River* -	9 52	7	5½
Cay West* - -	9 30	1½	1½	New Castle* - -	11 53	7	6½
Cay West, N.W. } Channel* - -	9 10	1½	1½	Philadelphia* -	1 18	6½	5½
Sand Cay* - -	8 40	2	1	<i>(New Jersey.)</i>			
Indian Cay* - -	8 23	2½	1½	Cape May Landing*	8 19	6	5
Cape Florida* -	8 36	1½	1½	Cold Spring Inlet*	7 32	5½	4½
Lower Mata- } cumbe Bay* -	8 23	2½	1½	Little Egg Harbour	7 10	4½	3½
St. Augustine* -	8 21	5	4	<i>(Long Island Sound.)</i>			
St. Johns River* -	7 28	5½	5	Watch Hill* - -	9 0	3	2½
Fort Clinch, Fer- } nandina* -	7 53	6½	6½	Stonington* - -	9 7	3½	3
St. Simons Island*	7 43	8½	6½	Little Gull Island*	9 38	3	2½
Doboy Lighthouse*	7 33	7½	7	New London* - -	9 28	3	2½
Savannah (City)* -	8 13	7½	6½	New Haven* - -	11 16	6½	5½
Fort Pulaski, Sa- } vannah (entr.)* }	7 20	8	7	Bridgeport* - -	11 11	8	6½
Hilton Head* - -	7 19	7½	6½	Sheffield Island*	10 58	8½	7½
St. Helena Sound*	7 8	7½	6	Oyster Bay* - -	11 7	9½	8
North Edisto R.* -	7 10	7	5½	Sands Point* - -	11 13	9	7½
Charleston* - -	7 26	6	5	New Rochelle* -	11 22	8½	7½
Bulls Island Bay -	7 16	5½	4½	Throgs Point* -	11 20	9½	7½
Georgetown* - -	8 40	4½	3½				
South } Island* - -	7 56	4½	3½				
Wilmington* - -	9 6	3	2½				

* From the United States Coast Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.													
		Springs.	Neaps.			Springs.	Neaps.												
(New York to Portland.)				Bay of Fundy, Nova Scotia.															
	h. m.	ft.	ft.		h. m.	ft.	ft.												
Tarrytown* -	9 57	4	3½	Cape Sable, Bar-	8 27	8½	6½												
New York* -	8 13	5½	4½	ington Bay, }															
Sandy Hook* -	7 29	5½	5	(Clam Point) - }	CapeSable,Clarkes	8 58	11	9											
Hell Gate Ap-				Harbour - }	Pubnico - -				9 25	12	10								
proaches* :					Argyle, (Jones }	9 27	12¾	10½											
— Long Island }	9 59	6	5½	Anchorage) - }	Seal I. (Cape Sable)				9 49	12¾	10½								
(Blackwells Dk.)* }					Ellenwoods An-	9 54	13	10½											
— — N. of Asto-	9 48	6½	5½	chorage - }	Jebogue - -				10 4	15	11½								
ria Ferry* - }					Yarmouth - -	10 9	16	13											
— — Pot Cove, }	10 48	8½	6½		East Sandy Cove, }	10 33	21½	17¾											
(S.E. part)* - }					St. Mary Bay - }				Petit Passage -	10 41	22	18							
— Wards Island }	10 9	6½	5			Grand Passage -	10 43	20¾	17										
(Paupers Dock)* }						WestSandy Cove, }	10 47	23	19										
Montauk Point* -	8 20	2½	2			St. Mary Bay - }				Digby Gut - -	11 0	27½	23						
Block Island* -	7 36	3½	2½				Port George -	11 17	32	28									
Point Judith* -	7 32	3½	3½				Isle Haute -	11 21	33	28½									
Newport* -	7 45	4½	4				Black Rock -	11 29	36	31									
New Bedford, entr.*	7 57	4½	4				Spencers Anchorage	11 42	39	33									
Bird Island Light*	7 59	5½	4½				Parsboro, Basin }	12 17	43	37½									
Kettle Cove* -	7 48	5	4½				of Mines }				Horton Bluff „ -	12 30	48	40					
Cuttyhunk* -	7 40	4½	3½					Noel Bay „ -	12 41	50½	43½								
Quicks Hole }								Bay of Fundy, New Brunswick.											
(S. Side)* }	7 36	3¾	3					Machias, Seal Isd.	11 5	18	14½								
„ (N. Side)* }	7 31	4½	3½					Seal Cove, Grand }	10 54	20	15								
Menemsha Bight*	7 45	4	2½					Manan - }				Grand Harbour, }	11 7	21	17½				
Woods Hole (entr. }									Grand Manan - }	Fish Head, Grand }	11 16	22½				18½			
from Vineyard }	8 34	2	1½							Manan - }			West Quoddy -	11 12	21		17		
Sound)* - }											Campobello }	11 21	23½	20					
— (entrance from }	7 59	4¾	4								(Welchpool) - }				St. Andrews -	10 50	25	21	
Buzzard Bay)* }												L'Etang Harbour -	11 19	23½	20				
Tarpaulin Cove* -	8 4	2¾	2½									Lepreau - -	11 18	24½	21				
Gay Head -	7 37	7										St. John Harbour	11 21	27	23				
Holmes Hole* -	11 43	1½	1½									Quaco - -	11 35	30	25				
Edgartown* -	12 16	2½	2									SpicersCove (near }	11 35	37	30½				
Hyannis* - -	12 22	4	3									Cape Chignecto) }				Grindstone Island -	11 47	41	34½
Nantucket* -	12 24	3½	3										Folly Point }	11 49	45	38			
St. George Shoals	10 30	7											(mouth of Petit-				Cumberland Basin }	11 55	45½	38
Monomoy* - -	11 58	5½	4										condiac River - }	(Sackville) - }	Monckton(Railway)	12 15	47				37½
Provincetown* -	11 22	10½	9½																
Wellfleet* - -	11 5	13½	12																
Cape Cod -	11 30	13																	
Barnstable - -	11 22	10	8½																
Plymouth* - -	11 19	11½	10½																
Boston Light* -	11 12	11	9½																
Boston (Charles-																			
town Naval Yd.)* }	11 27	11½	10																
Salem* -	11 13	10½	9																
GloucesterHarbour*	11 4	10½	8½																
Rockport* - -	10 57	10½	8																
Annisquam* - -	11 0	10½	9																
Ipswich* - -	11 26	10½	8½																
Newburyport* -	11 22	9	7½																
Portsmouth* -	11 23	10	8½																
Richmond Island*	11 30	10½	9																
Portland* -	11 25	10	7½																
Kennebec River }																			
(Hanniwells }	11 15	9½	7																
Point)* - }																			
Mount Desert Id. -	11 10	13																	
				Nova Scotia.															
				Negro Harbour -				8 12	7	5½									
				Shelburne - -				8 4	7	5½									

* From the United States Coast Survey, the time of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	h. m.	ft.	ft.
Rugged Island -	7 59	7½	6
Port Mouton -	7 54	7½	5½
Liverpool Bay -	7 50	8	5
Port Metway -	7 50	8	5
Cape le Have } (Spectacle Id.) }	7 48	7	5¼
Le Have, Crooked } Channel }	7 51	7½	6
,, Mothers Island	7 51	7	5½
,, Getsons Cove	7 55	7½	6
,, Bridgewater, } McKean's Wharf }	8 6	8	6½
,, Lunenburg } (Spidlers Cove) }	7 54	7½	6
Little Tancock Id.	7 43	7½	6
Mahone Bay, } Heckmans } Anchorage }	7 45	7½	6
,, Princes Inlet	7 42	7½	6
,, Ham Island	7 47	7½	6
,, Martin's River	7 43	7½	6½
,, Chester -	7 44	7	5½
Prospect River -	7 43	7	6
Blind Bay -	7 46	7½	6
St. Margarets } Bay, Shut-in Id. }	7 47	7½	6
Sable Island, N. side	7 30	4	
,, S. side	6 30	4	
Halifax Harbour -	7 49	6	5
Jedore Harbour -	7 45	6½	4½
Ship Harbour -	7 54	6½	4½
Sheet Harbour -	8 6	6½	4½
Liscomb Harbour -	8 0	6½	4½
Beaver Harbour -	7 40	6½	4½
Island Harbour, } Country Harb. }	7 40	6½	5½
Whitehaven -	8 0	6½	4½
Canso Harbour -	7 48	6½	4½
Crow Harbour -	8 0	6½	4½
Guysborough -	8 20	6½	4½
Pomquet -	9 15	4	2½
Cape George -	9 15	4	2
Merigomish -	10 6	5½	3½
Pictou Harbour -	10 0	6	4
Caribou Harbour -	10 0	6	4
Amet Sound -	10 30	8	5
Tatamagouche -	10 0	8	5
Wallace Harbour -	10 30	8	5
Pugwash Harbour -	10 30	7	4
Bay Verte -	10 0	9	5
<i>New Brunswick.</i>			
Jourimain Island -	9 30	6	3
Shediac Harbour -	{ 1 0 } { 8 0 }	4	2
<i>Prince Edward Island.</i>			
East Point -	8 30	3½	2
Cardigan Bay -	8 40	5	3½
Cape Bear -	9 0	6	3

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	h. m.	ft.	ft.
Hillsborough River:			
Charlottetown -	10 45	9½	8
Head of River -	11 0	10	7
Crapaud -	10 0	8	6
Bedeque Harbour -	10 15	7	5
Minimegash -	3 30	5	3
Egmont Bay -	3 0	4	2
Cascumpeque Hr. -	5 40	3	2
Richmond Harb. -	6 0	3	2
Cape Turner -	6 10	4	2
Grand Rustico -	6 40	4	2
Tracadie -	7 0	3½	2
St. Peter Harbour	8 30	4	2½
Boughton Harb. -	8 40	5	2½
<i>Cape Breton Island.</i>			
Port Hood -	9 0	4½	2
Gut of Canso, N. } entrance }	9 15	4	2
,, Plaister Cove	9 10	4½	3
Mabou River -	9 0	4	
Chetican -	8 15	3½	
Cape North -	8 0	4	
St. Anne Bay -	8 34	6	4½
Sydney Harbour -	8 15	5	4
Menadou Bay -	8 15	5½	
Louisburg Harb. -	8 0	5	4
St. Peter Bay -	7 30	6	4
Habitants Harbour	8 20	6½	4½
Arichat -	8 10	5	4
Bear Head -	8 30	4½	3
Poulament Bay, } Madame Island - }	7 50	6	4
Grande-digue, " -	7 55	6½	4½
<i>Labrador and Gulf St. Lawrence.</i>			
Eclipse Harbour, } Aulezavik }		5	
Sound -			
Hopedale -	5 38	7	4
Aillik Bay -		7	
Webeck -	6 21	7	4
Pomeroy Inlet, } Indian Harbour }	6 20	7	4
Indian Tickle -	6 37	6	4
Domino Run -	6 40?	6?	4?
Fall Harbour } (Telegraph Pt.) }	6 40	3½	
Chateau Bay -	7 35	3½	1
Red Bay -	7 45	3½	1½
Bradore Bay -	8 45	4	2
Belles Amour Bay	9 0	4½	2½
Bonne Esperance } Harb. - }	9 15	5	2½
Mistanoque -	10 30	6	3
Antrobus Island -	10 30	5	3
Wapitagan Harbour	10 30	5	3
Coacocho Bay -	10 30	5	3
Kegashka Bay -	10 45	5	3
Little Natashquan -	11 0	5	3

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Appetetat Bay -	11 10	5?	3?	Shippigan -	3 42	5½	3
Betcheween Har- } bour - - - }	11 32	5	3	Caraquette Harbour	2 40	6	3
Clearwater Point -	11 30	5	3	Miscou - - -	2 30	5	3
Mingan Harbour -	1 16	6	4	Miramichi Bar -	5 30	5	3
Mingan Island -	1 30	6	4	Sheldrake Island -	6 0	5	3
Bay of Seven Is- } lands - - - }	1 40	9	5	Vin Harbour -	5 45	5	3
Anticosti Island } (East Cape) - }	1 0	5	3	Beaubère Island -	6 30	6	4
" Bear Bay -	1 10	5	3	Point Escumenac -	4 10	4	2½
" West Point -	2 0	6	4	Richibucto River -	3 30	4	2½
Cawee Islands -	1 50	9	5	Buctouche River -	7 0?	4?	2?
Egg Island - - -	2 0	11	6	Cocagne River -	7 30?	4?	2?
Point de Monts -	12 0	12	6	<i>Newfoundland.</i>			
Cape Chatte -	12 0	13	8	St. Pierre - - -	8 33	6½	4½
Godbout River -	1 52	11	6	Lamalin Harbour -	9 15	8½	
St. Nicholas Harb.	1 55	12	7	Great and Little } Laun - - - }	8 15	7	4
Manicouagon River	2 15	12	7	Great St. Law- } rence Harbour }	8 30	7	4
Bersimis River -	2 0	12	7	Burin Harbour -	8 45	6½	4½
Bic Island - - -	2 15	14	8½	St. Mary Harbour -	7 40	7½	5
Port Neuf - - -	2 10	13	8	North Harbour -	8 0	7½	5
Matan River - -	2 15	11	7	Cape St. Mary -	8 30	7	5
Little Metis -	2 10	13	8	Placentia - - -	8 30	7	5
Saguenay, Tadousac	2 45	17	10	Trepassey Harbour	7 0	6½	5
" Chicoutimi	4 11	12	8	Cape Race - - -	7 0	6½	5
<i>River St. Lawrence.</i>				St. Johns - - -	7 30	6	4
Magdalen River -	11 0			Spaniards Bay -	7 45	4½	3
Mount Louis Bay	11 0	6-8	4	Harbour Grace -	7 25	4½	3
Green Island - -	2 45	16	9½	Carbonear - - -	7 20	4½	3
Brandy Pots - -	3 0	17	10	Hants Harbour -	7 13	4	3
Coudres Island } (Prairie Bay) - }	4 25	17	10	Smith Sound - -	7 8	3½	2½
Pillars - - - -	5 0	17	10	Bonavista - - -	7 25	3½	2½
Crane Island, } Middle Traverse }	5 24	17	13	Kings Cove - - -	7 15	3½	9½
Orleans Island, } North Traverse }	5 40	17	13	Bull Id., Trinity Bay	7 22	3½	2
Quebec - - - -	6 38	18	13	Hearts Content "	7 33	4	2½
Carouge River -	7 15	16	11	New Perlican } Harbour " }	7 30	4	2½
Frechette Island -	8 0	14	9	Greens Harbour -	6 44	3½	
Port Neuf - - -	8 30	14	9	Trinity Harbour "	7 10	3½	2
Grondine - - -	9 0	9	6	Random Head } Harbour - }	7 8	3½	2½
Cape Roche - -	9 30	6	4	Deer Harbour "	7 49	3½	2
Champlain - - -	9 45	3	2	Jones Harbour "	7 49	3½	2
Batiscan - - -	9 48	3½	2	Catalina Harbour -	7 0	6	4
Antigonish Harb. -	9 0	4	2	Barrow Harbour -	7 10	5-6	
Three Rivers - -	11 30	1		Fogo Island - - -	7 20	4	
<i>Gulf St. Lawrence.</i>				Funk Island - - -	7 0?	2-3?	
St. Paul Id. - - -	8 0	5	3	Triton Harbour -	7 0?	2-4?	
Magdalen Islands -	8 20	3	2	Cutwell Harbour -	7 0?	2-4?	
Gaspé Basin - - -	2 40	5	3	Fleur de Lis Harb.	7 15	2-4	
Point Macquereau-	2 0	5	3	Rouge Harbour -	7 0?	2-4?	
Carleton Point -	3 0	6	4	Croc Harbour - -	6 30	4½	
Dalhousie Harb. -	3 10	9		St. Julien Harbour { 6 30 P.M. }	7 21 A.M.	4½	3
Campbell Town, } Ristegouche R. }	4 0	10	7	Goose Cove - - -	7 0?	2-3?	
Bathurst - - - -	3 15	7	4	Braha Harbour -	7 0?	2-3?	
				Lunaire Bay - - -	7 0?	2-3?	
				Griguet Bays - -	7 0?	2-3?	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sacred B., (N. Cst.)	7 23	2½		Cape Agulhas -	2 50	5	
Cook Harb. (N. Cst.)	7 25	3?		St. Sebastian Bay } (Port Beaufort) }	3 8	6	
Good Bay -	10 40	7½	5½	Mossel Bay -	3 30	6	
St. John Harbour	10 40	7½	5½	Knysna Harbour -	3 30	6½	
Castors Harbour -	10 50	5?		Plettenberg Bay -	3 10	6	
New Ferole Cove } and St. Margarets Bay - }	9 28	4½ - 6½		Cape St. Francis -	3 34	5	
Old Ferole Harb. } and Brig Bay - }	9 46	5?		Algoa Bay -	3 5	6½	
Port-au-Choix, } (N. W. Coast) - }	10 47	5		Bird Islands -	4 0	4 - 5	
Cow Head Harb. -	10 41	8½	6½	Kowie River, Port } Alfred - - }	3 50	4 - 5	3
Petit Port, Bay of } Islands - - }	10 42	5½		Waterloo Bay -	4 0	6	
St. George Harb., } W. Coast }	10 3	6½	4½	East London, Buf- } falo River - }	3 43	5	3½
York Harb. „	10 37	5½?		St. John River -	4 0	5	
Little Port „	10 42	5½		Port Natal -	4 30	6	
Codroy Island -	9 15	6	4	Delagoa Bay, Eng- } lish River (Por- } tuguese Factory) }	5 20	12	
Port Basque -	8 55	5½	3½	„ (Port Melville)	4 30	15	
La Poile Bay -	9 0	6	4	„ Shefeen Island	4 40	12	
<i>Hudson Strait.</i>				<i>Africa, East Coast.</i>			
Button Islands -	6 50			Inhambane River -	4 15	10	
Fury and Hecla } Strait, Melville } Peninsula - }	7 0	8		Cape Bazaruto -	4 15	10	
<i>Hudson Bay.</i>				Sofala River -	4 0	19	
York Factory -	11 15	10-14		Quilimane River } (entrance) - }	4 15	16	
Ungava -		67*		Zambezi River } (Pearl Island) }	4 30	12 - 15	
<i>Arctic Regions, Greenland, West Coast.</i>				Luabo River (entr.)		22	
Julianshaab -	5 6	7	5	Angoxa River -		13	
Frederickshaab -	6 3	12½	9½	Antonio River -	3 15	13	10
Holsteinborg -	6 30	10		Mozambique Har- } bour - - }	4 15	12	
Upernivik -	11 0	8		Pomba Bay -	4 0	15	11
Wolstenholm } Sound - - }	11 8	7½		Oibo Harbour -	4 15	6	
<i>Barrow Strait.</i>				Mahato Island -	4 30	7	
Port Leopold -	12 6	6	4½	Cape Delgado -	4 0	16	11½
Erebus Bay -	12 6	8		Rovuma River -	4 0	16	11½
Griffith Island -	12 15	3½	2½	Pimlea Harbour -	4 30	12	
<i>Melville Island.</i>				Mungullo or } Mongallo River }	4 45	12	
Winter Harbour -	1 30			Lindy River (en- } trance) - - }	4 15	12	
Dealy Id., Brid- } port Inlet - }	1 48	4		Kiswara Harbour -	4 30	12	
<i>Baring Island.</i>				Quiloa -	4 45	12	
Bay of Mercy -		2		Latham Island -	4 0	10	
Prince of Wales } Strait - - }		3		Darra Salaam -	4 0	12	
<i>Africa, South Coast.</i>				Zanzibar (Channel)	4 15	11	
Simons Bay -	2 44	5½	3½	Zanzibar -	4 20	10	
Dyer Island -	2 50	5		Pemba Channel -	4 0	11	
				Port Cockburn, } Pemba Id. - }	4 15	12	
				Melinda -	4 0	11	
				Mombaza -	4 15	11	
				Lamo Harbour -	4 6	11	
				Patta Bay -	4 30	10	
				Port Durnford -	4 45	12	

* The Master of the Steamer trading in the bay for furs stated that he anchored at Ungava in six fathoms, and at low water he walked round his vessel. *Extract from a letter from Commander Chinn, R.N., H.M.S. Gannet, Sept. 1867.*

Place. ¹	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Brava - - -	4 30	8		Loheia - - -	1 30	3	
Marka or Muerka -	4 30	8		Sale Macowa -	0 30	2	
Magadoxa - - -	4 30	8		Jiddah - - -		3	
Warsheek Roads -	4 30	8		Murdounah Island	6 0	3	
Rás Hafún or Ha-foon - - -	6 15	4		(East Coast) - }			
Cape Guardafui or Ras Jerdaffoon }	6 15	6		Omaider Island	6 0	4	
Bander Alúleh -	6 45	6		(Gulfof Akabah) }			
Bander Gorí -	8 45			Rás Mahommed	6 0	5	
Berbereh or }				(Gulfof Akabah) }			
Burburra (Gulf of Aden) - }	7 15	9		Ushruffi Islands -	6 14	2	
Zeyla (Gulf of Aden)	7 15	8½		Suez Bay (head of Gulf) - }	2 0	6	
Ghubbet Ne. Socotra	7 0	7		Arabia, S.E. Coast.			
Ghubbet Gollonsir	7 20	8		Bab-el-Mandeb	12 0	7	
Bander Sháab -	7 0	7		Strt. (Perim Id.) }			
Abd-al-Kuri -	8 30	6		Bander Feikam -	10 0	8½	4½
Kal Farun -	8 20	6		Aden & adjacent	7 30 to	7	
				Bays* - - - }	9 30		
Madagascar, East Coast.				Sughrá - - -	8 0	6	
British Sound -	4 0	9½		Makátein - - -	9 0	6	
Port Leven -	3 30	7½		Rás-al-'Asidah -	8 30	5½	
Andrava Bay -	3 30	7		Makalleh - - -	8 30	7	
Antongil Bay }	4 0	5		Rás Sharmah -	9 0	8	
(Port Choiseul) }				Merbát - - -	9 0	6½	
Tangtang Harbour	4 30	6		Kuriyán Muriyán	8 20	6½	
Madame Island, St. Mary Harbour }	4 0	5		Bay & Islands }			
Tamatave -	4 18	8		Cape Isolette -	9 0	10	
Fénérine - - -		3½		Sháb Kadún -	9 20	10	
Fort Dauphin -	4 30	7		Jezírat Hamar-al-nafur - }	9 30	10	
				Sháb-'bu-saifeh -	9 45	10	
				Ghubbet Hashish -	10 0	10	
				'Om-rasas-Masírah	10 0	10	
				Rás Shébali -	10 0	10	
				Rás-al-Hed -	9 30	9	
				Khór Jerameh -	9 30	10	
				Persian Gulf.†			
				Maskat - - -	11 15	6	
				Jezírat Jún -	11 30	10	
				Rás al Kheī meh -	11 45	7	
				Al Bida' - - -	8 30?	6?	
				Bahreīn - - -	5 30	7	
				Jezírat Arabī -	6 30?		
				Jezírat Kabr -		8½	
				Koweyt - - -	0 15	9	
				Basrah (Bar) -	12 0		
				Jezírat Kharg or	8 0	6½	
				Kháreg - - - }			
				Abú-shehr - - -	7 30	7	
				Umm en Nakheī-lah - }	7 30?	8?	
				Tahrí - - -	5 0?		
				Jezírat Kais -	0 45	7½	
				Jezírat Tumb -		8	
				Lingeh - - -	12 0?		
				Básidúh - - -	12 0	10	
Red Sea.							
Bab-el-Mandeb St.	12 0	7					
Mocha Road (East Coast) }	12 0	4½					
Massowah - - -	1 0	3					
Zoola - - -		4-5	3				

* From a survey of Aden anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

† Deduced from observations made in the E.L.C. brig Euphrates 1857-58, and H.M. schooner Marie of the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiffe of H.M. Indian Navy.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Kesm - - -	11 0	12		Nosari Khari (Bar)	3 0	18	
Jezírat Lárek - -	10 15			Gundavi River -	2 0	19	15½
Basrah Town - -	6 0?	9		Bulsar Khari - -	1 45	18	14½
Jashk Shoal, } Beloochistan - }	9 30	8		Omersari River -	1 45	18	14½
Soonmianee Harb.	9 0	9?		Damaun (Bar) -	1 30	17	
<i>Hindoostan, West Coast.</i>				Versovah - - -	12 0	16	13
Karáchi entrance	10 30	9½	6	Bombay Dockyard	11 40	12-17	
Gisri River "	9 45	10		Rajpuri R. (entrance)	10 40	11	6
Piti River "	10 5	9		Bankot or Sivitri } River - - }	10 30	11	6
Kúdi or Coondee } River " }	9 50	10		Boria Bay - - -	10 0	10	8
Dubba River "	10 10	8		Ratna-ghíri - -	10 30	8	6½
Hajamri River "	9 40	8		Rájapur R. (en- } trance) }	11 0	9	7
Kediwári River "	9 57	7		" (Town)	12 20	7	
Waree River "	11 0	9½		Geriah or Viziadroog	11 0	9	7
Seer River, entrance	10 30	11		Deoghur Harbour } (entrance) - }	11 0	9	7
" Juggee -	1 30	6		Angria Bank - -	10 30	9	
Hukkar R., entrance	10 30	11		Vingorla - - -	11 0	8	6½
Kori or Lukput R.: (entrance) -	11 15	10½		Goa Bay - - -	10 30	7	5½
Lukput - - -	12 15	12		Sedashigar Bay* -	10 0	6½	5
Kotasir - - -	11 15	10½		Tudri River (Bar)	10 0	6½	5½
Gooria Creek - -	11 0	8½		Mangalore - - -	11 0	7	5½
Mandavee Rds. }	11 50	15	11	Tellicherry - -	11 40	5	4
Toona - - -	1 50	16	13	Calicut - - -	12 15	4	3½
Hanstul Mouth }	2 0			Beypore - - -	12 15	4	3½
Juria - - -	2 0	16	13	Cochin - - -	1 30	2½	2
Nowanugga - -	1 45	18	14	Anlapolay - - -	2 0	3	1-2
Roji - - -	1 40	18	14	Lakadivh Group -	10 30	6	4½
Ajár - - -	0 50	14	11	<i>Ceylon, South Coast.</i>			
Assar Point - -	12 0	12	8	Colombo - - -	1 0	2	
Seraia - - -	1 0	16	13	Dodandowe Bay -	1 50	1½	
Bate Harbour -	12 20	12	10	Pointe de Galle -	2 0	2	
Mouth of the } Gulf - - }	11 30			Belligam or Red Bay	2 20	2½	
Rúpon - - -	10 30	10	7	Kirindi - - -	3 30		
Pur Bunder - -	9 45	6		Batticalao River -	5 0	2-3	
Mangaról Bunder -	10 30	7	5	Trincomalie Har- } bour - - }	8 18	2	1½
M'hul Dwarka - -	10 30	7		Palmeira Point -	9 30	7-11	
Mandwa Creek - -	10 45	7	5	<i>Bay of Bengal, West Coast.</i>			
Diu Harbour - -	11 0	6	4½	Tuticorin Har- } bour and Road, }	1 15	2½	1½
Jafrabad Harbour -	11 35	9	7	(Gulf of Manar) }			
Shalbet Island - -	12 0	9	7	Keelacarry - -	11 0		
Mowah Bunder - -	1 0	12	9½	Paumben Pass -	1 30	2	
Goapnáth Point -	2 25	18	13½	Kitnapatnam (West } side of Palk }	11 0	1½	
Gogah - - -	3 50	Ord. Sp. } 27 to 30 }	21	Strait) - - -			
Bhowliaree } Creek - }	4 46	30	23	Negapatam - -	5 0	3	
Singoteer Mata } Cambay }	5 20	24		Nagore - - -	8 15		
(Town) - - -	5 10	Night 30 } Day 23 }		Madras Road - -	7 34	3½	
Dhardur R. } (entrance) }	4 30	27	20-22	Pulicat Shoals -	9 25	2½	
Broach Point } (Nerbudda }	3 40	25		False Point - -	8 0	8	
River) - - -				Point Divy - -		5	
Surat Roads - -	2 45	19	15	Coringa or Coca- } nada Bay }	9 10	4-5	3
" (Town) - -	4 0	19		" River (Bar)	9 0	5	

* Spring tides rise, a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Balasore River -	10 0	15		Chagos Archipelago, (Diego Garcia) -	1 30	6	
Kedgeriee -	11 30			Peros Banhos -	1 30	5	
Sangor Island -		12	6 - 9	Solomon Islands -	1 30	5	
Western light vessel (entrance to Hoogly) -	10 0	10½		Seychelle Archipelago, (Mayhé Island) -	4 0	6½	
Mutlah River, Western or Ward's Channel -	9 0	10		Curieuse Island -	5 10	7	
" (entrance to Biddah River) -	10 0	14		Amirauté Isles, (St. Joseph I.) -	5 0	8½	
" (Muda Kali) -	11 45	15		Comoro Islands, (Maroni Bay, Comoro) -	4 53	10	
Kedgeriee to Diamond Harbour -		18*		" (Douany, Mohilla) -	4 0	11-12	
Calcutta -	2 30	12 - 15		" (Numa-Choa, Mohilla) -	3 0	14	
<i>Bay of Bengal, East Coast.</i>				" (Anchorage, Johanna) -	3 40	11	
Hastings Harbour (Mergui Archipelago) -	10 40	14		" (Pomony Harbour, Johanna) -	4 0	11	
Mergui -	10 30	18		" Zaudzi Anchorage, Mayotta) -	4 10	12	
Tavoy River, (entrance) -	10 30	20		Aldabra Islands -	5 0	10	
Maulmain " -	2 0	22	17	Maldives, Adou Atoll -	1 0	4	
Martaban -	2 20	21		" Suadiva Atoll -	1 0	4	
Rangoon R. (entrance) -	3 15	21	14	Maldives, Adou Matte Atoll -	3 0	4	
Rangoon -	5 30	21	14	" Male -	12 30	3	
Bassein River (entrance) -	10 0	9	6	" Malcolm Atoll -	10 30	3	
Ramree Road -	10 0	12		" Heawandou Pholo Atoll -	9 30	5	
Kijouk Phyou Harbour -	10 0	9	6	Laccadives, Cherbaniani Reef -	10 0	7	4
Akyab, Aracan River (Bar) -	9 45	9	6	Ghubbet Gollon-sir, Sokotra -	7 20	8	
Naafe River (entrance) -	10 0			Keeling Islands (Port Refuge) -	5 30	5	
Cheduba Island -	11 30	8		Christmas Id. -	10 0		
Diamond Island -	10 30	8		Nicobar Islands, Nancowry Harbour -	9 15	8½	
Chittagong (Bar) -	1 15	15	10	Andaman Islands, Port Blair -	9 30	7½	
<i>Islands in Indian Ocean.</i>				" Port Cornwallis -	10 0	8½	
Kerguelen (Christmas Harbour) -	2 0	2		" Andaman Strait -	10 24	9½	
St. Paul Island -	11 0	3		<i>Malacca Strait, Malay Coast.</i>			
Amsterdam Id. -	11 0	3		Junkseylon Island (East side) -	10 0	11½	
Mauritius, Port Louis -	12 30	3	2½	Queda -	12 0	5½	
" Grand Port -	1 0	1½					
Reunion or Bourbon Island, (St. Pierre) -	Noon	3½					
Reunion or Bourbon Island, (St. Denis) -	0 22	2½					
" (St. Gilles) -	1 0	2½					
" (St. Paul) -	1 7	4					
Rodrigue Island -	1 45	6					
Cargados Carajos Shoals -	2 0	4					

* In March and April.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Penang (Georgetown) -	12 0	9	7½	Wynkoops Bay (S.W. Coast) -	5 0	5½	4
Lt. Vessel (One Fathom Bank) -	6 0	15	12	Zand Bay -	5 0	4¾	
Arroa -		10		Bantam -		5	
Cape Rachada -	5 30	13		Batavia -	10 0	2	
Sambilangs -		12	10½	Kalang Bayang Harbour -		2	
Malacca Road -	7 30	11	8½	Krakatoa -	7 0	4	
Off Mount Formosa -	8 0	11	8½	<i>Sumatra, N.E. Coast.</i>			
Tanjong Bolus -	9 30	10½	8½	Pulo Aor -		5	
North Sands -	5 30	15	12½	St. Barbe -	6 0	6	
Singapore, New Harbour -	9 45	10	7½	Badas Id., Linga Bay* -	6 0 P.M.	12	
Rhio -	10 0	7	5	Batoo Barra -	2 50	7-10	
<i>Malacca Strait, Sumatra Coast.</i>				Dheli River -	3 0	8	
Diamond Point -	12 0	9½		<i>Sumatra, West Coast.</i>			
Siak River (entrance) -	9 0	12		Bencoolen -	6 0	3-5	
„ off the town -		11		Sillebar River (Bar) -	6 0	4½	
<i>Timor.</i>				Mensular Island (S.E. end) -	6 0	4	
Koepang -	11 0	9	6½	Tappanoely Harbour -	6 10	6	
Dilhi or Dielli -	1 0	6		Acheen Head -	8 45	8	
<i>Sumba or Sandelhout, North Coast.</i>				Diamond Point -	12 0	9½	
Nangamessie Harbour -	11 30	17	13½	<i>Durian Strait.</i>			
Palmedo Road -		15		Sabon Island -		10	
<i>Sumbawa.</i>				Deep Point -	5 0	10	
Ragged Island -	8 10	3		Red Island -	5 0	10½	
Sapie Bay -	1 0	10		<i>Banka Strait.</i>			
Britannia Bay -	1 0	11-12		Toboe Ali Point -	8 30 P.M.† 10 0 A.M.†	12	
Bima Bay -	Noon	6		Lucipara Pass -	irr.	10	7½
<i>Lombok, West Coast.</i>				Nangka Island -	7 0	9½	
Ampanam Bay -	8 0	6		Cape Oelar -	6 30	12	
Peejow Bay -		10-12		Bersiap Point -	6 30	12	
<i>Baly.</i>				Kalian Point -	8 17½	12½	
Badong Bay (South Coast) -	11 0	9½		Lobah Point -	11 0†	10	
Tebunkos Road (North Coast) -	5 0	6½		<i>Gaspar Strait.</i>			
<i>Java.</i>				Pulo Mendanao -	2 30	4	
Sourabaya Strait (Zee Bank) -	irr.	4-6		Pulo Leat -	2 30	4	
„ Jansen Channel -	irr.	8½		<i>Java Sea.</i>			
Banjoewangie -	1 0	9		Crimon Islands -	8 0	6	5
Segoro Wedie Bay -	9 0	8-10		<i>Celebes.</i>			
Patytan Bay -	3 0	7		Macassar -	4 0	54½	
Tylatiap Harb. (South Coast) -	8 45	3½		<i>Flores Sea.</i>			
Tytando Inlet -	6 30	5	3½	Adenara, Flores -		8	
				<i>Moluccas.</i>			
				Batchian, Gilolo -	1 0	6	
				Sanguir Island -		6	

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig, Saracen.

† In S.E. Monsoon.

‡ In N.W. Monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Gèby, Fohou Island		5		Boerong Island -	4 45	7	
Manganitoe Bay -	5 0			Rajang River -	4 45	13	9
Limbé Strait -		5		Bruit River -	3 0	11	
Sannana Bay -		9		Bintula River -	5 45	6	
Koelwatte Bay -		7		Labuan Island } Victoria Harb. }	9 45	6	
Wahaay and Hati-ling Bays -	6 0	3 - 4		Mungulum Island -	11 0	5	
Bouro, Cajili Bay	1 32	4½		Bruni River -	11 0	12	
Amboyna -	0 33	7		Dalawan Bay } (Balabac Is-land) }	11 0	5	
Saparocaa Island -		6		North Balabac Strait -	10 50	5	
Cambing or Passage Island -	noon	6		Malludu Bay, Borneo N. Coast }	10 30	6 - 8	
Banda, Banda Islands	4 0	6 ?		Balambangan Id. -	10 0	6 - 8 ?	
Dampier Strait -		11		Unsang (Borneo, N.E. Coast) -	8 0	3½	
<i>Filipinas.</i>				Ragged Point, Borneo, E. Coast }		7	
Port Zebú -	12 0	7		Famarung Islands (Borneo East Coast) -		8 - 10	
Port Buluagan } O'sta Ana - }	12 0	5½		Eran Bay (Palawan, West Coast) -	10 10	6½	
Port Iliolo -	12 0	5½		Tay-bay-oo-bay "	10 15	6	
Port San Jacinto, Ticao Island -	6 30	6		Ooloogan Bay "	9 30	5½	
Mindanao (S. Point)	7 0	6		Mayday Bay "	9 55	3½	
Manila (Luzon) -	10 40	5 - 7		Port Barton (Bubon Point) "	10 55	6	
Port Sual "		6		Pancol "	9 40	6	
Scarborough Shoal	11 0	5		Bacuit Bay "	10 0	6	
Port Laguimanoc "	1 30	5½		Cavern Island "	9 30	5½	
Alabat Harbour "	10 0	9		Observatory Island -	11 0	5½	
Paluan Bay (Mindoro) -		5		Ursula Island (Palawan, East Coast) -	11 0	7½	
Busainga (Burias Id.)	12 30	6		Port Royalist -	11 0 ?	6½ ?	
<i>Loo Choo Islands.</i>				Millman Island (Palawan, West Coast) -	10 27	2½	
Nafa-Kiang -	6 28	7		Casuarina Point "	9 30	6½	
Port Oonting -	6 35	8		Barren Island "	9 30	5½	
Oho Sima, Vincennes Bay -	7 30	5½		Bird Island "	9 30	6	
" Wild Wave Bay -	8 0	8		Tai-Tai Bay -	9 30	5½	
<i>Bonin Islands.</i>				Batanes, Bashee Islands -		4	
Port Lloyd, Peel Island -	6 8	3		Port Kok-si-kon (Formosa, East Coast) -	11 30	3	
New Port, Hillsborough Id. -	11 32	3½		Tam-Sui Harbour "	11 45	7 - 10	
<i>China Sea, East Coast.</i>				Kelung Harbour (Formosa, N. Coast) -	10 30	3	
St. Pierre, Island -		4		Sau-o Bay -	5 50	6	4½
Rendervous Island, Borneo, S.W. Coast -		8					
Tanjong Api -		7					
Sarawak River (Moratabas entrance) -	4 0	9	5½				
" Santubong -	4 0	10	6				
" Sarawak Junction }	5 0	15 - 18	9				
" " City }	5 20	15 - 18	9				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Babuyan Islands.</i>					<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Port Pio Quinto, } Camiguin Island }	6 0	6	ft.	Junk Fleet entr., } Canton River }	11 50	6½	
Port Musa, Fuga } or New Babuyan }				Tailung Channel „ } Lankeet Id., Can- }	1 30	6½	
		5		ton River }	11 20	6½	
<i>China Sea, West Coast.</i>				Lintin Id. „ }	12 0	7½	
Romania Point, } (Malay Penin- }	10 30		ft.	Fan-si-ak Channel „ }	1 0	7½	5
sula, E. Coast) }				Chuen-pee Point „ }	2 0	7½	
Sedili River (en- }	9 44	7		† Wham- { Mar. - }	1 40	7-8	
trance) „ }				poa Dks. { April - }	1 15		
Blair Harbour „ }	8 50	9		May & }	0 30		
Pulo Timoan (West }	6 0	7½		Kuper Id. { Mar. - }	2 40	5½	
side) - }				off Canton { May & }	1 40	5½	
Binkang Bay (Co- }	11 30	5		City { June - }			
chin China) - }				Sam-shui, Si Kiang }		5-6	
Tringano River }	8 0	7		or West River. }			
(Gulf of Siam, }				Shao king „ - }		3	
West Coast) - }	5 7	9½		Wu-chu „ - }		1-1½	
Menam River, }				Hong Kong Road - }	10 15	4½	
Paknam „ }	5 7	6½		Ninepin Group - }	10 0	5	
Cape Liant (Gulf }				Tide Cove, Mirs Bay }	10 0	6½	
of Siam, E. Coast) }	10 0	5½		Tooni-ang Id. Bias }	8 0		
Chentabun River }				Bay - }			
(entrance) „ }	4 0	4		Tsang-chow Id. }	8 30		
Rocky Island (Gulf }				Bias Bay - }			
of Siam, E. Coast) }	7 0	2		Hong-hai Bay - }	10 0	6½	
Pulo Panjang - }				Kin-siang Point, }	7 0		
Pulo Condore }	2 30	6½		Hie-chechin Bay }			
(Cochin China)* }				Cupchi Point - }	8 0		
Saigon, Cochin }	11 0	8		Swatau (Double Id.) }	3 0	9	
China, Cape St. }				Clipper Road, Na- }	11 15	7	
James - }	5 30	9½		moa Id. - }			
„ Saigon City }				Chauan Bay - }	11 0	6½	
Nhatrang Bay }	8 30	5½		Tongsang Harbour }	11 30	12	
(Cochin China, }				Chimney Id. Rees }	11 30	12	
E. Coast - }	11 30	5		Pass - }			
Hon-cohe Bay „ }				Makung Harbour }	10 30	9½	7
Turon Bay „ }	3 0	4		(Pescadores) - }			
Galong Bay }				Amoy, Inner Harb. }	12 0	18½	14½
Hainan Island, }	9 5	2½		Hu-i-tau Bay - }	12 15	16	
Yu-lin-kan Bay - }				Chimmo Bay - }	10 20	16	
Quan-chow-wan, }	9-10	9-10		Chin-chu Harbour - }	12 25	17	
Tongking Gulf }				Meichen Sound - }	12 30	17	
Namo Harbour - }	10 0	7½		Hai Tau Strait - }	12 15?	16?	
Tien-pak Harbour }				White Dog Ids. - }	9 0	18	
(China, E. Coast) }	12 0	8½		Min River, Tem- }	10 45	19	14½
Hui-ling-san - }				ple Point - }			
Pratas Shoal - }	8 15	7½		Min R., Losing Id. }	12 0		
Boddam Cove, }				Chang-chi Island - }	9 30	17	
Ladrone Ids. - }	4 0	5		Spider Island - }	10 0	17	
Canton River }				Lishan Bay - }	10 15	16	
(entrance) - }	9 40	4½		Namquan Harbour }	10 0	17	
Broadway River }				Namki Islands - }	8 30	17	
(entrance) - }	11 0	7½		Pih-ki-shan Ids. - }	8 30	17	
Typa Anchorage - }				Fong-whang- }			
Macao - }	10 0	7		group, Bullock }	8 30	17	
Cumsingmun Har- }				Harbour - }			
bour, Canton R. }	10 0	6½		Wan-chu River (ent.) }	9 0	15½	
	12 6	6½		„ City }	9 30	15½	

* From a French Survey, 1862.

† At Whampoa Docks—In March, the day and night tides rise to the same level. From April to October, the day tides are the higher, and from November to February the lower. In May and June the level of spring tides is 4 feet, and the neaps 2 feet higher than in March.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Towan Island -	9 20	13		Ta-tsing ho -	4 10	10½	8
Tai-chow Islands -	9 0	14		Peiho or Peking	3 40	10	7½
St. George Id. } San-moon Bay }	10 20	15		River (entr.)† -			
Kweshan Islands -	9 30	14		Tien-tsin, Peiho	7 0	4½	
Nimrod Sound -	10 30	20		River -			
Vernon Channel, } Chusan Archi- }	9 40	14		Peh-tang ho -	3 33	10	7½
pelago -				Sha-lui-tien Banks	2 50	10	8
Ting-hae Harbour	11 0	12	9	(west part) -			
Poo-too Island -	8 15	12		Liau-tung, Ching	1 20	6½	
Lansey Bay -	10 0	13		ho -			
Volcano Islands -	11 30	15		Lau-mu ho -	1 30	5	
East Saddle Island	11 0	14		Tai-cho ho -	0 15	6	
Yung River, Chinhae	11 20	12½		Yang ho -	0 15	6	
Yung River, Ning- }	1 0	9		Ning-hai -	12 0	6	
po-fu }				Sand Point, Gulf	4 50	7	5½
Hang-chu Bay, }	11 45	14		of Liau-tung) -			
Seshan Ids. -				N.W. Head of Gulf	5 30	10	8½
" Fog }	11 45	17		of Liau-tung -			
" Islands }				Liau Ho (Bar)	4 0	11½	7½
" Chapu }	12 0	25		" (entrance)	5 0	12	
Road }				Vansittarts Saddle	4 20	10	8½
Hang-chu Bay }		32		Hulu Shan Bay -	2 30	8	6
(off Can-pu) -				Society Bay, Suli-	0 15	8	
Gutzlaff Island -	11 30	15		van Bay -			
Yang-tse Kiang }	12 0	15	10	Port Adams, Mary	2 0	10	
(light ship at				Island -			
entrance) -	0 30	15	10½	Pigeon Bay -	11 45	8	
" entrance }				Ta-lien-whan Bay	10 47	10½	8
to Wusung }	0 30	15	10½	Encounter Rock -	10 44	11	8
River -				Haiyun-tau	9 30	12	8
Pheasant Point, }	0 35	13	8	(Thornton Haven)			
Wusung River }				Chodo Id., Korea,	6 20	12	
Shanghai -	0 40	10	7	W.C. }			
*Langshan Crossing	1 40	12	8	Basil Bay "	4 15	18	10
Kiu-kiang -		24		Marjoribanks	3 30	29	
Hankau -		33 - 38		Harbour "			
<i>Yellow Sea.</i>				Ko-kun-to Group, "	2 25	18	10
Wang-kia-tai Bay	6 0	12	9	Korea, S. Coast,	9 28	11½	8½
Wei-hai or Kyau- }	5 0	12	9	Kuper Harb. -			
chau Bay -				" Crichton Harb.	9 50	11½	8½
Ching-tau Bay -	6 0	12	9	" S. Coast, }	8 58	11½	8½
Lo-shan-kau -	4 30	11	9	Tracy Island -			
Staunton Island -	1 30	8	5½	" Hooper Id. -	9 10	11½	8½
Wang-kia Bay -	2 30	9	7	" Port Hamilton	8 30	11	
Shihtau Bay -	1 30	9	7	<i>Japan Sea.</i>			
Sang-tau Bay -	0 55	7	4½	Yung hing Bay -	5 20	2½	
Aylen Bay -	2 30	6	4	Tsau-liang-hai or	7 45	7	5
Litan Bay -	3 0	6	4	Chosau Harbour }			
Wei-hai-wei Har- }	9 30	9		(Korea -	7 45	9	
bour -				Kame-ura, Kiusiu			
Lung-mun Harbour	10 0	7		Island -	7 15	9	7½
Chifu -	10 34	8	6½	Nagasaki Bay }			
Hope Sound (Mi- }	10 24	6½		(Nipon, S. C.) -	9 44	8½	1½?
au-tau Group) }				Taské -			
Miau-tau (Depôt }	10 35	6		Oösuka -	9 16	8½	1½?
Bay) -				Tama no Ura }	6 - 8	4 - 6	
				Harb., Goto Id. }			
				Iki -	8		

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.
† Time and rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tsu-sima Sound -	8 30	8	6	Port Adventure -	12 20	8	6
Simonoseki -	8 30	8	6	Patersons Inlet -	1 10	8	6
Sado (Yebisu) -	5 0	2		Port William -	12 45	8	6
Tsugar Strait -	5 0	5		<i>New Zealand:</i>			
Hakodadi Har- } bour, Yezo Id. }	5 0	3		<i>Middle Island, East and North Coasts.</i>			
Endermo Har- } bour, Yezo Id. }	5 30	6		Bluff Harbour -	1 18	8	6
La Perouse Strait -	10 30	6		Molyneux Bay -	3 0	8	6
Yoku-hama, Yedo } Bay - }	6 0	6½	4½	Otago Harbour } (entrance) - }	2 50	7	5
Tatuyama Bay -	5 50	5		Akaroa Harbour -	3 24	8	6
Fatsizio -	6 0	5		Port Lyttelton, } formerly Port }	3 50	7½	3½
Port Simoda -	5 0	3 - 5		Cooper - }			
Heda Bay -		5½		Kaikora Peninsula	5 30	8	6
Enora Bay -		4		Cape Campbell -	6 0	8	6
Simidsu -	7 30	7		Port Underwood -	6 10	8	6
Urakami -	7 30	6	5	Queen Charlotte } Sound (entrance) }	8 50	8	6
Oösima -	6 50	5		Port Gore -	9 0	8	6
Tanabé Ki Channel	6 0	6	5½	Pelorus Sound } (entrance) - }	9 35	11	7
Uranouchi „ -		5		Port Hardy -	9 55	8	6
Osaki „ -	5 55	6½		Croisilles Harbour	9 0	12	8
Hiogo and Corvi } Bays - }	7 15	5½	4½	Nelson -	9 50	14	10
Oösaka River (en- } trance) - }	7 30	5½	4½	Massacre Bay, } Tasman Corner }	8 45	13	9
„ City -	8 17	2½	½	— Motu Pipi }			
Kata Channel -	6 4	6½		River, W. Ent. }	9 50	14	10
Yura Harbour „ -	6 5	6½		Cape Farewell -	9 20	14	10
Naruto (Fukura) „	6 17	7		<i>Middle Island, South and West Coasts.</i>			
Akasi -	6 36	6½?		Runpuke Id. (Fo- } veaux St.) - }	1 0	8	6
Awasima (Inland } Sea) - }	0 14	7		New River (Orete)	12 10	8	6
Tomo (Seto-uchi)	11 0?		5	Centre Id. (Fo- } veaux St.) - }	12 15	8	6
<i>Gulf of Tartary.</i>				Prescrvation Inlet	11 20	8	6
St. Vladimir Bay	irr.	2		Chalky Inlet -	11 5	8	6
Napoleon Road } (West Coast) - }	2 30	2½		Dusky Bay -	11 15	10	8
Port Michael Sey- } mour, Olga Bay „ }	5 30	3		Daggs Sound -	11 30	8	6
Barracouta Har- } bour „ - }	10 0	3½		Thompson Sound -	11 30	8	6
Castries Bay „ -	10 30	6		Bligh Sound -	10 45	8	6
Jonquiere Bay } (East Coast) - }	10 0	6		Milford Sound -	9 15	8	6
Amur Strait -	11 40	5 - 6		Okarita Lagoon -	11 40	9	
Cape Maria (Sag- } halin Id.) Sea }	2 0	5		Hokitika Bar -	9 39	8½ - 9	
of Okhotsk -				Grey River -	10 15		
<i>Kamchatka.</i>				Teremakan River	9 55	9	
Avatcha Bay -	3 30	6½	4½	<i>North Island, South and West Coasts.</i>			
<i>New Zealand:—South or Stewart Island.</i>				Port Nicholson, } Lambton Harbour }	4 30	5	3
Mason Bay -	11 10	8	6	Mana Island -	7 0	8	6
S.W. Cape -	12 0	7	5	Kapiti Island -	9 0	6	
Port Pegasus -	11 50	8	6	Manawatu River -	10 0	8	6
				Wanganui River -	10 15	8	6
				New Plymouth } (Taranaki) - }	9 30	12	9
				Kawhia Harbour -	9 30	12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Aotea Harbour -	10 0	12	9½	Danger Point -	9 30	6	4½
Waikato River -	9 30	12	9	Shoal Bay -	8 30		
Maunkau Harbour } (entrance) -	9 30	13	10	Richmond River -	9 20		
Whaingaroa Harb. -	9 50	12		Cape Byron -	9 45	6	
Kaipara Harbour } (entrance) -	10 55	10	9	Tweed River } (Danger Point) }	9 45	5 - 8	
Hokianga River } (entrance) -	9 45	10		Moreton Bay -	9 30	3 - 7	
" (Kokohu) -	10 15	10	7	Brisbane Bay (Bar)	10 4	6	4½
Cape Maria Van } Diemen -	8 0	7		Great Sandy Strait } (Woody Id.) -	9 14	10	7
Three Kings Is- } lands -	8 0	7		Sandy Cape -	7 50	6 - 8	
<i>North Island, East Coast.</i>				Port Curtis -	9 40	10 - 12	
Cape Palliser -	6 0	6		Byron Bay -	9 45	6	
Wairoa River -	6 45	7	4	Wreck Reef, } (Bird Islet) -	8 3	6	
Hawke Bay } (Ahuriri Har- } bour) -	7 50	3		Cato Bank -	8 0	6	
Poverty Bay -	6 5	6		Lady Elliot Islet -	9 0	7 - 8	
East Cape -	8 55	7		Heron Islet, } Capricorn Group }	9 0	10	
Hicks Bay -	9 0	7		Keppel Bay -	9 30	9 - 14	
Tauranga Harbour	7 10	6	4½	Great Barrier Reef	8 48	7	
Mercury Bay -	7 21	7	5	Saumarez Reef -	8 0	6	
Gt. Barrier Island } (Nagle Cove) -	6 25	10	7	Frederick Reef -	8 0	6	
Auckland Harbour	7 5	11	9	Kenn Reef -	8 0	5½	
Kawau Island -	6 30	10	7	Middle Bellona Reefs	8 30	6	
Wangari Harbour -	7 0	9	7	Avon Isles -	8 30	5	
Tutukaka Harbour	7 0	9	7	Chesterfield Islet -	8 30	5	
Wangaruru Harbour	7 10	9	7	Mellish Reef (Sand } Cay) -	7 55	5 - 6	
Bay of Islands, } (Motu Mea Islet) }	7 15	9	6	Thirsty Sound -	10 45	12 - 18	
Wangaroa Harbour	8 15	7		Port Bowen -	9 35	16	
Cavalli Islands -	8 0	7		Shoal Water Bay -	10 30	12 - 18	
Monganui Harbour	8 15	9	7	Broad Sound -	11 0	20 - 30	
Awanui River -	7 44	7		Swain Reefs -	10 25	10	
Parenga-renga } Harbour -	7 54	7		Percy Isles, Middle } or No. 2 Island }	10 30	16	13
<i>Australia, East Coast.</i>				(West Bay) -			
Twofold Bay -	10 0	7	5	" South or } No. 1 Islet, }	10 30	14	
Botany Bay -	8 15	7 - 8		(N.W. Bay) -			
Jervis Bay -	6 20	6 - 9		West Hill -	10 20	24	
Port Jackson, } North Head -	8 15			Cape Conway -	11 0	18	
Sydney -	38	4½	4	Goold Island -	6 45	6	
Broken Bay -	8 0	6 - 9		Port Denison -	9 30	6	
Newcastle or Port } Hunter -	9 0	3½ - 5		Upstart Bay -	9 0	6	
Port Stephen -	9 0	6		Cleveland Bay -	7 30	10 - 12	
Manning River -	9 15	4		Palm Isles -		8 - 10	
Crowdy Head -	9 15	5	3	Dunk Island -	9 28	6 - 10	
Port Macquarie -	8 56	4 - 5		Fitz-Roy Island -	9 15	7 - 12	
Solitary Islands -	9 15	5	3	Endeavour River -	8 0	5 - 10	
Clarence River } Head -	9 0	6	4½	Trinity Opening, } Great Barrier }	9 15	7 - 12	
				Reefs -			
				Lizard Island -	9 15	7 - 10	
				Willis Islets -	8 0	6	
				Osprey Reef -	8 36	6	
				Flinders Group -	9 15	8 - 12	
				Cape Sidmouth -	9 15	10	
				Cape York -	11 15	10	7

[illegible]

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port Fairy -		4		Eddystone Point -	9 39	7	
Portland Bay -	Midnight	4		Georges Bay -	9 42	3	2
Macdonnel Bay -	3 0	5		Cape Pillar -	1 0	6	
Rivoli Bay -	10 0	4		Port Arthur -	7 52	4	
Port Elliot -		5 - 6		Hobarton -	8 15	4½	3½
Troubridge Shoals	3 30	6		Macquarie Harb. -	7 30	3	
* Hungry Point, } Troubridge - }	4 18	7	4 - 6	<i>Islands in South Pacific.</i>			
Port Wakefield -	5 0	9		Easter Island -	2 0		
Port Adelaide -	4 30	9		Bow Island -	2 40	3	
† Semaphore Jetty	4 40	6½-8	5-5½	Oparo Harbour -	12 23	2½	
Cape Willoughby, } Kangaroo Id. - }	4 10	6		Tabuai Id. -		3	
Pelican Lagoon, } Kangaroo Id. - }	5 0	6		Tahiti or Otaheite Id.	noon.	1½	
Spencer Gulf:				Resolution Bay, } Sta. Christina, }	2 30	4	
Thorny Passage	12 0	6 - 8		Marquesas - }			
Marion Bay -	2 6	4		Fannings Id. -		4	
Gambier Islands	2 0	5		Pago Pago, Navi- }		4½	
Corny Point -	2 45	4		gator's Ids. }			
Port Victoria -	2 40	5		Manna " -		6	
Point Riley -	5 45	4½		Tongatabu -	6 50	6	
Plank Point -	6 15	6 - 8		Vavu -	6 20	5	
Port Pirie -	7 15	9 - 11		Port Resolution, }	5 35	3	
Point Webling	6 10	6 - 9		Tanna Island - }			
Point Lowly -	7 0	6 - 8		Port Inyang, }	6 35	4	
Port Augusta† -	8 30	9 - 12		Aneiteum - }			
Wallaroo -	irr.	4 - 5		Banks Ids., Port }			
Port Eyre -	10 30	6		Patteson, Vanu }	6 40	5	
St. Francis Isle, } Petrel Bay - }	12 0	6		Lava Id. - }			
Blancheport, }	1 0	5		" Ids., Port Sand }			
Streaky Bay - }				wich, Mali- }	5 30	4	
Smoky Bay -	12 15	6		collo Id. - }			
Denial Bay -	12 15	6		" Vila Harbour, }	5 0	5	
Fowlers Bay -	10 30	6		Sandwich Id. }			
Venus Harbour -	2 15	6		" Havannah }			
West Cape Howe -	9 0	6		Harb. Sand- }	7 15	4	
King George }				wich Id. - }			
Sound, Princess }	11 56	1 - 4		" Dillon Bay, Er- }	5 30	4	
Royal Harbour }				romango Id. - }			
<i>Bass Strait.</i>				Mboli Harbour, }			
Refuge Cove -	12 5	8		Florida Island, }	5 30	6	
King Island (Sea } Elephant Bay) }	9 30	12		Solomon Ids. - }			
Hunter Island -	11 30	8		Nairai Id. Fiji Ids.	5 53	4½	3½
Three Hummock } Island, E. side - }	10 30	10		Moala " -	5 50	5	
Swan Island -	9 35	6		Matuku " -	6 18	5	3
Kent Island -	11 10			Makongai and }	6 0	4	3
Murray Pass -	11 10	8		Wakaya Ids. " }			
<i>Tasmania.</i>				Ono Ids. " -	6 0	4	
Circular Head -	11 40	9		Tova or Na Vatu }	6 8	4	
Tamar River, Port } Dalrymple }	12 5	10	7½	Reef - }			
(Georgetown) }				Vatoa or Turtle Id.	6 11	4	
Tamar River, }	1 0	12½		Nandi Passage }	6 35	4½	
(Launceston) - }				and Bay - }			
				Erronan or Futuna	7 24	4	
				Sandalwood Bay, }	6 0	6?	
				Fiji Islands - }			
				Ngaloa, Kandavu }	6 0	5	
				Id., Fiji Islands }			
				Mbau Roads, Viti }	5 45	6	
				Levu, Fiji Ids. }			

* From observations made between Feb. and May 1868.

† Deduced from observations made between Sept. 1867 and Feb. 1868. During these months the a.m. tides were found to rise higher than the p.m. In the winter months the reverse is said to be the case. About the neaps the tides are very irregular.

‡ At Port Augusta, when the wind veers round to West and South and blows strong, the rise has been as much as 16 feet. Commander John Hinchison R.N. Admiralty Survey. South Australia. 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port Nukulau or Rewa Road, } Fijii Ids. - }	6 47	5½		Philip Bay, eastside	9 30	24	
Wreck Bay, Lifou } Id., Loyalty Ids. }	6 30	5	6	Gregory Bay -	9 30	24	18
Balade Harbour, } New Caledonia }	6 30	4?		Second Narrows -	10 0	23	
Port Alcmène, Isle } of Pines, New }	8 6	4		Peckett Harbour -	12 0	6	
Caledonia - }				Laredo Bay -	11 30	9	
Port de France, } Numea Bay, New }	8 25	4		Sta. Magdalena Id.	12 0	10	
Caledonia - }				Sandy Point Road	12 0	5	
Port St. Vincent, } New Caledonia }	5 50	4½		Port Famine -	12 0	6	
Devarenne St., New } Caledonia }		3½		Cape San Isidro -	1 0	8	
Port Balad „	6 15	4½		St. Nicolas Bay -	2 6		
„ Iengen „	6 15	4½		Cape Froward -	1 0		
„ Uinne „	6 48	4½		Port San Antonio -	12 0	7	
Triton Bay, New } Guinea - }	1 8	7		Labyrinth Islands-	0 30	5½	
Woodlark Island }				Port Gallant -	9 0	5½	
Louisiade Archip. }	7 15	4		York Road, }	2 0	9	
Port Carteret, New }		6		English Reach }			
Ireland - }				Bachelor River -	1 40	5	
Lord Howe Island	8 30	6		Borja Bay -	1 50	7	
Middleton Reef -	8 30	6		Playa Parda Cove-	1 8		
Norfolk Island -	7 45	7		Port Tamar -	3 5	5	
Chatham Id., Port }	6 50	6		Valentine Harbour	2 0		
Hutt - }				Harbour of Mercy-	1 22	4	
Auckland Id. Port }	12 0	3		Cape Pillar -	1 0		
Ross - }							
Campbell Island }				<i>Smyth, Sarmiento, Wide, and Messier Channels.</i>			
South or Perse-	12 0	3½		Goods Bay -	0 30	7	
verance Harb. - }				Fortune Bay -	0 50	7	
Raoul or Sunday Id.	6 0	5		Welcome Bay -	0 50	7½	
				Puerto Bueno -	1 40	8?	
<i>Islands in North Pacific.</i>				Guia Narrows -	2 10	8	
Karakoa Bay, }	3 49			Fury Cove -	1 15		
Owyhee - }				Eden Harbour -	12 30	5	
Honoruru, Sand-	4 0	2		Halt Bay -	0 30	8	
wich Islands - }				Middle Island -	12 0		
Pouinipet Island, }	6 0	4½					
Caroline Islands }				<i>Tierra del Fuego, S.W. Coast.</i>			
Saipan Island, }	6 45	2½		Cape Horn -	4 40	9	
(Ladrone Ids.)- }				St. Francis Bay -	4 0		
Pelew Islands -		6		St. Martin Cove -	3 50	8	
Midway Island -	3 13	3		Middle Cove -	3 30		
				Goree Road -	4 0	8	
<i>South America, Strait of Magellan.</i>				Lennox Cove -	4 40	8	
Cape Virgin -	8 30	36 - 42		Nassau Bay -	4 0	6	
Dungeness -	8 30	27-30		Good Success Bay	4 3	6-8	
St. Catharine Pt. -	8 5	30		Packsaddle Bay -	3 30	6	
Cape Espiritu Santo	8 30	36 - 42		Orange Bay -	3 30	5	
Possession Bay -	8 35	42		New-year Sound -	3 30		
Direction Hill -	8 53	23-38		Adventure Cove -	3 10	4	
Cape Orange -	3 0			March Harbour -	3 10	6	
First Narrows -	9 0	36 - 42		Doris Cove -	3 0	4	
				Stewart Harbour -	2 50	4	
				Townshend Harbour	2 30	5	
				Fury Harbour -	2 30	4	
				North Cove, Fury }	2 30	4	
				Island - }			
				Hewett Bay -	0 30	6½	
				Bedford Bay -	0 30	7½	
				Smyth Harbour -	12 0	6½	
				Noir Island -	2 30	5	

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Ecuador.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Sta. Clara Island -	4 0	11		Acapulco - -	3 6	1½	
Morro, Sandy Point of	5 0	11		Perula Bay - -		7	
Puna Island -	6 0	11		San Blas - -	9 41	6½	
Guayaquil -	7 0	11		Mazatlan - -	9 40	7	
St. Elena Bay -	1 18	8		Culiacan River -	11 30	6?	
Salango Id. -	0 41	12		St. Lorenzo Channel	8 30	6	
Port Manta -	3 4	6		Guaymas Harbour	8 0	4	
Caracas River -	3 30	10		<i>California and Oregon.</i>			
Cape Pasado -	3 30	10		San Lucas Bay -	9 20	9½	
Atacames Bay -	3 37	13		Magdalene Bay -	7 35	6½	
Santiago River -	3 30	13		Port San Quentin -	9 5	9	
Tumaca Road -	2 33	12		Bartho-			
Sanguilanga (en-				lomeu - }	9 10?	7 - 9?	
trance) - }	4 10	9		Playa Marie Bay -	9 20?	7 - 9?	
<i>Galapagos Islands.</i>				Cerros Island -	9 10	7 - 9	
Charles Island -	2 10	6		Sta. Barbara Island	8 0	3½	
Albemarle -	2 0	6		San Diego Bay *	9 38	5	3½
Chatham -	2 23	6½		San Juan Anchor-			
Indefatigable -	1 56	6		age - }	9 40?	5	
James, I., West-end	3 10	5		San Pedro Anch. *	9 45	4½	3½
" N. side -	2 34	5		San Miguel, }	9 25	5	4
" Adam Cove	2 14	5		(Cuyler Harb. *) }			
Tower Id. -	?	?		San Rosa Island -	9 30?	5?	4?
Culpepper Id. -	?	?		Santa Catalina Id. -	9 35?	5?	4?
Wenman Isles -	2 10			Santa Cruz Id. -	9 35?	5?	4?
<i>New Granada and Veragua.</i>				San Luis Obispo *	10 8	4½	3½
Port Buenaventura }				Monterey* -	10 22	4½	3½
(Negrilla Reef) }	4 0	13		South Farallon* -	10 37	4½	3½
" off the Town -	6 0	13		San Francisco -			
San Juan River -	6 0	12		" North Beach*	12 6	4½	3½
Cabita Bay -	3 40	12		Drakes Bay* -	11 41	4½	3½
Port Utria -	4 0	12		Bolega Port* -	11 17	4½	3½
Cupica Bay -	3 30	13		Humboldt Bay* -	12 2	5½	4½
Octavia Bay -	3 30	13		Port Orford* -	11 26	6½	4½
Pinas Bay -	3 15	14		Columbia River, }			
Chepo River -	3 40	16		Entrance - }	0 15	7½	
Pedro Gonzales, }				Astoria* -	0 42	7½	6
(Trapichi Id.) - }	3 50	16		Nee-ah Harbour* -	12 33	7½	6½
Chamé Bay -	4 0	16		Port Townshend* -	3 49	5½	5
Taboga -	4 0	14		Fort Steilacoom* -	4 46	11	9½
Panama Road -	3 23	15 - 22	10 - 16	<i>Vancouver Island, Juan de Fuca Strait, and British Columbia.</i>			
Port Nuevo -	3 10	12		Sooke Harbour -	2 0	8	
Parida Island -	3 15	10½		Esquimalt Harb.† -	irr.	7 - 10	5 - 8
<i>Central America, West Coast.</i>				Victoria Harbour†	irr.	7 - 10	5 - 8
Nicoya Gulf (Port				Inner Channels }			
Herradura) }	3 9	10		leading from }			
Port San Juan del }				Juan de Fuca }	irr.	10 - 12	
Sur - }	3 8?	10?		Strt. to Haro St. }			
Port Realejo -	3 6	11		Griffin Bay, Haro }			
Port la Union, }				Archipelago - }	irr.	12	
G. of Fonseca - }	3 15	10½	8½	Roche Harbour, }			
Acajutla Road -	2 25	9		Haro Strait - }	irr.	12	
<i>Mexico, West Coast.</i>				Port Discovery -	2 30	7	
Port Guatulco -	1 30	5		Nisqually, Puget }			
" Sacrificios -	3 15	6		Sound - }	6 0	18	15
				Fane Id., Plum-			
				per Sound - }	irr.	12	

* From the U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment
† May to October, from Midnight to 3 a. m. November to April from Noon to 3 p. m.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Drayton Harb.,	2 0	12		Deep Harbour,	12 0	16	11½
Semiahmoo Bay	6 30	7-10		Fife Sound			
Fraser River (entr.)				Takush Harbour,	1 0	14	9
Burrard Inlet,	6 0	16		Smith Inlet			
G. of Georgia -				Cullen Harb. "	12 0	16	11½
Plumper Cove,	noon.	12		Quatsino Sound,	11 0	11	
Howe Sound*	noon.	12		Vancouver Id.			
Port Graves*				Klaskino Inlet	12 0	12	
Stuart Channel,	6 0	10		Klaskish Inlet "	12 0	12	
(Oyster Harb.)				Nasparte Inlet "	12 0	12	
" (Cowitchin		10-12		Ou-Ou-Kinsh	12 0	12	
Harbour) -				Inlet			
Maple Bay		12		Kyuquot Sound,	12 0	12	
Nanaimo Harbour	5 0	14		Vancouver Id.			
G. of Georgia -				Esperanza Inlet "	12 0	12	
Nanoose Harbour,	5 0	15		Nuchatlitz Inlet "	12 0	12	
Vancouver Id.				Nootka Sound,	12 0	12	
Pender Harbour,	6 0	13		Vancouver Id.			
Strt. of Georgia*	5 0	12		Hesquiat Harb. "	12 0	12	
Port Augusta				Barclay Sound,	12 0	12	
Hernando Island,	6 0	12-14		Island Harbour			
(Baker Passage)				Clayoquot Sound	12 0	12	
Strt. of Georgia							
Sturge Narrows	6 0	12		<i>America, North West Coast.</i>			
Rendezvous Ids.	7 0	14	12	Schooner Retreat,	0 30	14	11
Stuart Island	6 0	12-14		Fitz Hugh Sound			
Waddington Harb.,	6 0	13		Safety Cove, Fitz	1 0	14	11
Bute Inlet				Hugh Sound			
Gowlland Harb.,	5 30	11		Gold Stream Har-	1 0	15	12
Discovery Pas-				bour, Fitz Hugh			
sage				Sound			
Seymour Narrows	4 0	11		Namu Harbour,	1 0	15	12½
Cameleon Harb.,	3 0	16	11½	Fitz Hugh Sound			
Nodales Channel	3 0	16	11½	McLaughlin Bay,	1 0	14	10
Forward Harb.,				Fitz Hugh Sound			
Beaver Creek,	3 0	16	11½	Skidegate Inlet	1 0	17	14
Loughborough				Alpha Bay, Pitt	1 0	20	
Inlet				Island			
Topaze Harbour	3 0	16	11½	Duncan Bay,	12 0	21	
Knox Bay	12 0	16		Chatham Sound			
Port Neville†	0 30	17	12	Port Kuper	1 40	13	10½
Port Harvey†	0 30	10		Port Simpson	0 35	21½	14½
(Call Creek) -				Portland Inlet,	1 8	16	
Beaver Cove		15		(Salmon Cove)			
Alert Bay, Cor-		15		Sitka§	0 34	5-7	
morant Id.				Behring Bay	0 30	9	
Nimkish River	0 30	14		Port Etches	1 15	9½	
Beaver Harbour†	0 30	15½	11½	" Chalmers	1 0	13½	
Shushartie Bay†		12		" Chatham	1 0	12	
Bull Harbour,	0 30	12½		Ounalashka Island	7 30	7½	
Goletas Channel†				Cape Roshnoff	7 30	15	
Blunden and Tra-				Good-news Bay	6 15	13½	
cey Harbours,	12 0	16	11½	Golovnin Bay	6 23	3½	
Queen Charlotte				Port Clarence	4 25		
Sound				Chamisso Island	4 42		
Cypress Harbour,	12 0	16	11½	Point Barrow	11 45	½-¾	
Sharp Passage							

* From observations made in the month of October.

† From observations made in May.

‡ From observations made in the month of October.

§ The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860. does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation (1862), the local pilots say that the rise sometimes is as much as 16 feet.

T I M E

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PLACES GIVEN IN THE PRECEDING PAGES;

ARRANGED ALPHABETICALLY;

*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Abaco, Bahamas - -	8 0	8		Agadir, or Santa Cruz, Africa.	12 45	9	
Abbey Head, England -	11 10	23	17	Aggerminde, Jutland -	4 9	2	
Abd-ul Kuri, Indian Ocean	8 30	6		Agnes, St., Scilly Isles -	4 30	16	
Aberdeen, Scotland - -	1 0	12	10	Agulhas Cape, Africa, S. Coast.	2 50	5	
Aberdovey, Wales - -	8 0	15		Aillik Bay, Labrador -		7	
Abervrach, France - -	4 14	22	16	Air Point, River Dee, England.	10 54	25	19
Aberystwyth, Wales -	7 31	13½	10	Aix, Ile d', Charente R., France.	3 20	17	12½
Abrolhos, Brazil -	3 20	6-7		Ajár, Hindoostan, W.C.	0 50	14	11
Abtao I, Patagonia, W.C.	0 50	18		Akaroa Harb., New Zea- land.	3 24	8	6
Abú-shehr, Persian Gulf	7 30	7		Akasi, Japan Sea -	6 36	6½?	
Acajutla, Central America	2 25	9		Akyab, Aracan R., Bay of Bengal.	9 45	9	6
Acapulco, Mexico, W. Cst.	3 6	1½		Al Bidá, Persian Gulf -	8 30?	6?	
Acheen Head, Sumatra -	8 45	8		Alabat Harbour, Luzon -	10 0	9	
Achillbeg, Ireland - -	5 14	10½	8	Alan Island, Patagonia, W. Coast.	0 31	18	
Adam Bay, Australia, N. Coast.	6 0	18		Albany Ids. (Port Albany) Australia, E. Coast.	12 15	10	7
Adams Port, (Mary Id.) Yellow Sea.	2 0	10		Albemarle Id., Galapagos	2 0	6	
Adelaide Port, Australia, S. Coast.	4 30	9		——— Port, Falkland Islands.	7 15	7	
Aden and adjacent Bays, Arabia, S. E. Coast.†	{ 7 30 to 9 30 }	7	4½	Albert River (Kangaroo Point) Australia, N. Coast.	7 30	10-13	3-8
Adenara, Flores, Malay Archipelago.		8		Alcmène Port, Isle of Pines, New Caledonia.	8 6	4	
Admiralty G., Australia, N.W. Coast.	12 0			Aldabra Ids., Mozambique	5 0	10	
Adolphus Id., Australia, N.W. Coast.	7 30	21		Aldborough, England -	10 45	8?	6½?
Adou Atoll, Maldives -	1 0	4		Alderney, English Chan- Alert Bay, Cormorant	6 46	17	12½
Adou Matte Atoll, Mal- dives.	3 0	4		Id., Johnstone Strait, Vancouver Id.		15	
Adventure Cove, Tierra del Fuego.	3 10	4					
——— Port, New Zealand.	12 20	8	6				
——— Sound, Falk- land Islands.	5 30	5½					

* By the Rise of the Tide is meant its vertical rise above the mean low-water level of Spring Tides.

† From a Survey of Aden Anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Alexander Port, Africa, S.W. Coast.	3 0	5		Antongil Bay (Port Choiseul), Madagascar.	4 0	5	
Alfred Port, Kowie River, Africa, S. Coast.	3 50	4-5	3	Antonio Cap ^e St., Cuba		1½	
Algeçiras, Spain -	1 49	4	2½	——— River, Africa, E. Coast.	3 15	13	10
Algoa B., Africa, S. Cst.	3 5	6¼		——— St. Port, Patagonia, E. Coast.	10 45	18-30	
Alligator Rvr. Australia, N. Coast.	8 15	15		——— St. Port, Magellan Strait.	12 0	7	
Alloa, Firth of Forth, Scotland.	3 18	17½	15	Antrobus Id., G. St. Lawrence.	10 30	5	3
Alpha Bay, N.W. Coast of America.	1 0	20		Antwerp, Belgium - -	4 25	15	
Altona, Germany - -	5 19	7		Aor Pulo, Sumatra, N.E. Coast.		5	
Amboyna, Moluccas -	0 33	7		Aotea Harb., New Zealand	10 0	12	9½
Ameland Gat, Netherlands	9 0	7		Apalachicola B., Gulf of Mexico.		2¼-4	
——— Hollum Rd., „	11 30	7		Appetetat B., Gulf St. Lawrence.	11 10	5?	3?
Amet Sound, Nova Scotia	10 30	8	5	Appin Port (Loch Linnhe), Scotland.	5 26	12½	8½
Amiranté Isles, (St. Joseph Id.) Indian Ocean.	5 0	8½		Appledore, England -	5 28	23	16½
Amlwch, Wales - -	10 30	18?	13?	Aquin Bay, St. Domingo	irr.	2-8?	
Amoy (Inner Harbour), China, East Coast.	12 0	18½	14½	Aracan R. (Bar), Bay of Bengal, E. Coast.	9 45	9	6
Ampanam B., Lombok -	8 0	6		Aracati, Brazil - -	6 0	8	6
Amsterdam, Indian O. -	11 0	3		Araish El, Africa, N. Cst.	1 30	9-12	
Amulgawein, Persian G.	11 40	6		Arasaig, Scotland -	5 50	13½	10
Amur Strait, G. of Tartary	11 40	5-6		Arauco Bay, Chile - -	10 15	6	
Andaman Ids., Port Blair, Indian Ocean.	9 30	7½		Arbroath, Scotland -	1 35	14	11
——— Port Cornwallis	10 0	8½		Arcachon, France - -	4 37	11½	9½
——— Strait, Indian Ocean.	10 24	9¼		Arcas Rks. G. of Mexico	noon	1½	
Andrava B., Madagascar	3 30	7		Ardglass, Ireland -	11 0	16	12
Andres, San B., Patagonia, W. Coast.	0 45	5		Ardintallan, Loch Feochan, Scotland.	5 31	9	6½
Andrews, St., Bay, G. of Mexico.	irr.	1-2		Ardrishaig, Loch Fyne -	11 53	9	7½
——— New Brunswick	10 50	25	21	Ardrossan, Scotland -	11 45	10	8
Anegada, Virgin Islands	9 0	1½		Arenas Pt., San Carlos, Patagonia, W. Coast.	0 14	6	
Aneiteum (Port Inyang), S. Pacific.	6 35	4		Argyle, Bay of Fundy -	9 27	12½	10½
Angoxa River, Africa, E.C.		13		Arica Road, Peru - -	8 0	5	
Angra, Azores - -	12 32	4½		Arichat, Nova Scotia -	8 10	5	4
——— Pequena, Africa, S.W. Coast.	2 30	8		Arinagour, Coll Id., Scotland, W. Coast.	5 39	12½	9½
Angria Bank, Hindoo-stan, W.C.	10 30	9		Arkangel, White Sea -	7 28	2½	
Anna Pink B., Patagonia, W. Coast.	0 45	5		Arklow, Ireland - -	8 45	4	3
Annan Foot, England -	11 56	20	14	Arnhem B., Australia, N.C.	8 10	6	
Annapolis, United States	4 38	1	1	Arroa, Malacca Strait -		10	
Anne, St. B., Cape Breton	8 34	6	4½	Arthur Port, Tasmania -	7 52	4	
Annisquam, United States	11 0	10½	9	Arundel, England -	12 25		
Anno Bom Id., Africa	3 45	5		——— (Bar) - -	11 35	16	11½
Anticosti Id., G. St. Lawrence, East Cape -	1 0	5	3	As Rocas, S. Atlantic -	5 15	10	
„ Bear Bay -	1 10	5	3	Asaph St., B., Australia, N. Coast.	5 45	14	
„ West Point -	2 0	6	4	Ascension Id., S. Atlantic	5 30	2	
Antigonish Harb. R. St. Lawrence.	9 0	4	2	Askaig Port, Islay -	4 58	6¼	4
Antigua Id. (English Harb.), Caribbean Sea.		2		Assar Point, Hindoostan, W.C.	12 0	12	8
				Astoria, Oregon -	0 42	7½	6
				Atacames Bay, Ecuador	3 37	13	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Atchafalay Bay, G. of Mexico.	h. m. irr.	ft. 2-2½	ft.	Ballysadare (Quay), Ireland.	h. m. 6 0	ft. 8½	ft. 5½
Athline, Loch Seaforth -	6 16	15	10	Ballyshannon (Bar) -	5 18	11½	8½
Atico Road, Peru - -	8 53	5		Ballyweel, Ireland -	5 23	12½	8
Auckland Harb., New Zealand, N. Island.	7 5	11	9	Balta, Scotland - -	9 45	6	4½
Auckland Id., S. Pacific (Port Ross).	12 0	3		Baltimore, Ireland - -	4 23	10½	8½
Augustine St., U. States	8 21	5	4	United States	6 33	1½	1½
St., B., Madagascar, W. Coast.	4 30	13		Banana Ids., Africa, W.C.	8 15	9	
Aulapolay, Hindoostan, W. Coast.	2 0	3	1-2	Bankot or Sitri R., (entrance) Hindoostan, W. Coast.	10 30	11	6
Anlezavik Sound, Labrador.		5		Banda, Molaccas -	4 0	6½	
Aux Cayes Bay, St. Domingo.	irr.	2-3½		Bander Alúleh, G. of Aden	6 45	6	
Avatcha B., Kamchatka -	3 30	6½	4½	Gorí, Gulf of Aden	8 45		
Avon Isles, Australia, E.C.	8 30	5		Sháab, Ind. Ocean	7 0	7	
Avon River, Bigbury Bay, England.	5 47	16½	11½	Feikam, Arabia, S.E. Coast.	10 0	8½	
Awasima (Inland Sea) Japan.	0 14	7		Banff, Scotland - -	0 28	10½	8
Awanui R., New Zealand	7 44	7		Banjoewangie, Java -	1 0	9	
Axim, Africa, W. Coast.	4 30	4		Banoko, Africa, W. Cst.	5 24	5	
Aylen Bay, Yellow Sea	2 30	6	4	Bantam, Java - -		5	
Aymann, Persian Gulf -	11 20	6		Bantry Harb., Ireland -	3 47	10	7½
Ayr, Scotland - -	11 50	8½	7½	Baracoa, Cuba - -	7 23	2½	
Point of, I. of Man	11 7	20½	16½	Barataria Bay, Gulf of Mexico.	irr.	1½	
Bab-el-Mandeb, G. of Aden	12 0	7		Barbados, Caribbee Ids.	irr.	2	
Bachelor R., Magellan St.	1 40	5		Barbara Port, Patagonia, W. Coast.	12 28	6	4
Bacuit B., China Sea, E.C.	10 0	6		L Santa, California	8 0	3½	
Badas Id., Linga Bay, Sumatra.*	6 0 PM	12		Barbe St., Sumatra, N.E. Coast.	6 0	6	
Badong B. (S. Cst.), Baly Bagroo River, Sherbro River, Africa.	11 0	9½	11	Sta. Id., California	8 0	3½	
Bahia, Brazil - -	4 15	8		Barclay Sound (Island Harb.), Vancouver Id.	12 0	12	
Bahrein, Persian Gulf -	5 30	7		Uchucklesit Harbour, Vancouver Id.		12	
Balabac Id., China Sea, E. Coast.	11 0	5		Bardsey Id., Wales -	7 40	15	
Balad Harb., New Caledonia.	6 15	4½		Barfleur, France - -	8 51	17	13½
Balambangan Id., Borneo, N. Coast.	10 0	6-8		Barmouth, Wales - -	7 41	17	13½
Balasore R., B. of Bengal, W. Coast.	10 0	15		Barnstable, United States	11 22	10	8½
Balbriggan, Ireland -	10 40	11		Barnstable Bridge, England.	6 28	10½	
Bald Head, United States	7 26	5	4½	Barquero (entrance); Spain, N. Coast.	3 0	15	
Ballachulish (Loch Leven), Scotland.	5 43	11		Barra, Id. (North Harbour), Scotland, W. C.	5 48	11½	8½
Ballinacourty, Dungarvan, Ireland.	5 12	12½	9½	Castle Bay, Scotland, W.C.	5 44	11½	8½
Ballinskellig Bay, Ireland	3 40	12	7½	Head, Bernerad Id., W. Coast of Scotland.	5 45	11½	7
Ballycastle B., Ireland -	6 25	3	2	Barracouta Harb., G. of Tartary.	10 0	3½	
Ballycottin, Ireland -	4 54	12	9½	Barragan Bay, Rio de la Plata.†	7 0	5-9	
Ballycrovane, Kenmare River, Ireland.	3 42	10½	7½	Barren Id., China S., E. C.	9 30	5½	
Ballynakill Bay, Ireland	4 40	12½	9½	Barren Ids., Madagascar	4 45	12	
Ballyness (Bar), Ireland	5 22	11½	8½	Barrow Harbour, Newfoundland.	7 10	5-6	
				Point, Arctic Regions	11 45	½ - 2	
				Barry Id., Wales -	6 39	35½	26

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig Saracen.

† In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Barton Port, (Bubon Point), China Sea E.C.	10 55	6		Bell Sound, Spitzbergen	8 56	3½	
Bas, Ile de, France -	4 49	23	17	Belles Amour B., Labrador	9 0	4½	2½
Básidúh, Persian Gulf -	12 0	10		Belligam Bay, Ceylon -	2 20	2½	
Basil Bay, Korea, W. C.	4 15	18	10	Bellona Reefs (Middle), Australia, E. Coast.	8 30	6	
Basque Port, Newfoundland.	8 55	5½	3	Bembatooka Bay, Madagascar, W. Cst.	4 30	16	
Basrah (Bar), Persian Gulf.	12 0			Bembridge Pt., England	11 0	14	10½
Basrah Town - -	6 0?	9?		Benbecula, Scotland -	6 3	11½	8½
Bassein R., Bay of Bengal.	10 0	9	6	Bencoolen, Sumatra -	8 0	3-5	
Batanes, Bashee Islands, China Sea, E. Coast.		4		Benevente, Brazil -	3 0	5	
Batavia, Java - -	10 0	2		Benguela, Africa, W. Cst.	3 45	5-6	
Batchian, Gilolo, Moluccas	1 0	6		Benin R., Africa, S. Cst.	4 30	7	
Bate (Gulf of Kutch), Hindoostan, W. Coast.	12 20	12	10	Benton Castle, Cleddau River, Wales.	6 23	20	14½
Bathurst, G. St. Lawrence	3 15	7	4	Berbereh or Barburra (Gulf of Aden) Africa, E. Cst.	7 15	9	
Bathz, Netherlands -	3 15	15		Berbice, Guayana -	4 30	8-10	6
Batiscan, R. St. Lawrence	9 48	3½	2	Bergen, Norway - -	1 30	4	
Batoo Barra, Sumatra -	2 50	7-10		Berkeley Sound, Falkland Islands.	5 0	7	
Batticalao River, Ceylon	5 0	2-3		Bermudas: Ireland Id., N. Atlantic.	7 14	4	
Bawdsey Haven (see Woodbridge Haven).				Bernera, Loch Roag, Lewis Id.	6 11	11	8
Bay of Harbours, Bull Road, Falkland Islands.	6 0	5		Berneray I., Sound of Harris.	6 11	13	9½
Bay of Islands, (Motu Mea Islet,) New Zealand.	7 15	9	6	Bersiap Point, Banka Strait.	6 30	12	
Bay of Mercy, Banks Land		2		Bersimis R., Gulf St. Lawrence.	2 0	12	7
Bayonne (Bar), France -	3 45	12	10	Berwick, Scotland -	2 18	15	11½
Bazaruto Cape, Africa, E.C.	4 15	10		Betcheween Harb., G. St. Lawrence.	11 32	5	3
Beachy Head, England -	11 20	20	15	Beypore R. (entrance), Hindoostan, W. Cst.	12 15	4	3½
Beagle Bay, Australia, W. Coast.	11 30	13-15		Bhowliaree Creek, Hindoostan, W.C.	4 46	30	23
Bear Cape, Prince Edward Island.	9 0	6	3	Bias Bay (Tooniang Id.,) China E. Coast.	8 0		
Bear Head, C. Breton Id.	8 30	4½	3	—— (Tsangchow Id.) China, E. Coast.	8 30		
Beatrice Islet, Australia, N. Coast.	3 0	8		Bic Id., G. St. Lawrence	2 15	14	8½
Beaubère Id., Gulf St. Lawrence.	6 30	6	4	Biddah R, B. of Bengal, W. Cst.	10 0	14	
Beaufort, United States -	7 26	3½	2½	Bideford, England -	6 7	16	
Beaulieu, England -	{ 10 25 12 15 }	10	8½	Bijouga Islands, Arcas Channel, Africa, W. Cst.	10 10	11-14	9
Beaumaris, Wales -	10 32	21½	16½	—— Bissao, Africa, W. Cst.	11 0	8	
Beaver Cove, Vancouver Island.		15		—— Orango Channel, Africa, W. Cst.	10 0	11	
—— Creek, Loughborough Inlet, B. Columbia.	3 0	16	11½	Bilbao (Bar), Spain -	3 0	13	
—— Harbour, Vancouver Island.	0 30	15½		—— (Town), „ -	3 20	9	
—— Nova Scotia -	7 40	6½	4½	Biloxi, G. of Mexico -	irr.	2	
Bedeque Harbour, Prince Edward Island.	10 15	7	5	Bima Bay, Sumbawa -	Noon.	6	
Bedford Bay, Tierra del Fuego.	0 30	7½		Binkang B. China Sea, W. Cst.	11 30	5	
Behring Bay, America, N.W. Cst.	0 30	9		Binnic, France - -	6 3	30	22½
Belfast, Ireland - -	10 43	9½	8				
Belgrano Port, La Plata	6 0	12	10				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bintula R., China Sea, E. Cst.	5 45	6		Boria Bay, Hindoostan, W. Coast.	10 0	10	8
Bird Island, China Sea, E. Cst.	9 30	6		Borja B., Magellan Strait	1 50	7	
— Ids., Africa, S. Cst.	4 0	4-5		Borkum (Road) Germany	10 30	8-10	
— Id. Light, United States.	7 59	5½	4½	Boscastle, England -	5 15	25	17½
Blaavand Point, Jutland	1 44	5		Boston (Sluice), England	7 0	12	
Black Ball Harb., Ireland	3 40	9½	7½	— Deep (Clay Hole) „		21½	
Black Rock, Bay of Fundy	11 29	36	31	— Hob Hole „ -		17	
Black Point Bay, Africa, W. Coast.	4 30	6		— (Charlestown Naval Yard) United States.	11 27	11½	10
Blacksod Bay (Quay), Ire- land.	4 47	10	8½	— Light, United States	11 12	11	9½
Blacktoft, River Humber	6 59	16		Botany Bay, Australia, E. Cst.	8 15	7-8	
Blair Harb., China Sea, W. Cst.	8 50	9		Boteler R., Madagascar -	4 30?	15?	
Blakeney, England -		9		Boucaut, France -	3 39	8½	6
— (Bar) „	6 30	15		Boughton Harb., Prince Edward Island.	8 40	5	2½
Blanche Port, Streaky Bay, Australia, S. Coast.	1 0	5		Boulogne, France -	11 25	25	19½
Blankenberg, Belgium -	12 48	13	11	Bourbon Id., Indian Ocean, <i>see</i> Reunion Id.			
Blanco Cape, Africa, W. Coast.	11 46	6		Bouro (Cajili Bay) Mo- luccas.	1 32	4½	
Blas, San, Mexico, W. Cst.	9 41	6½		Bow Island, S. Pacific -	2 40	3	
— La Plata -	2 0	12	10	Bowen Port, Australia, E. Cst.	9 35	16	
Blasket Islands, Ireland -	3 30	11½	8	Bowling, R. Clyde, Scot- land.	0 39	9	
Blewfields, Mosquito Coast	1 50	2		Boyanna B., Madagascar, W. Cst.	4 30	15	
Bligh Sound, New Zea- land.	10 45	8	6	Bradore Bay, Labrador -	8 45	4	2
Blind Bay, Nova Scotia	7 46	7½	6	Braha Harbour, New- foundland.	7 0?	2-3?	
Block Id., United States	7 36	3½	2½	Bramble Cay, Torres Strt.	9 15	12	
Bluff Cay, Bahamas -	7 0	4½		Brandy Pots, River St. Lawrence.	3 0	17	10
Bluff Harb., New Zealand	1 18	8	6	Brass River, Africa -	4 0	6	
Blunden Harbour, Brit. Columbia.	12 0	16	11½	Brava, Africa, E. Cst. -	4 30	8	
Blyth, England -	3 15	15	11	Bray Head, Ireland -	10 45	12	9½
— R., Southwold, England.	10 20	6½	4½	Brazos River, G. of Mexico	irr.	1½	
Boca de Varadero, Cuba	8 39	2		Bréhat, France -	5 51	31	23½
Boddam Cove, Ladrone Islands.	9 40	4½		Brest, France -	3 47	19	13½
Bodega Port, California	11 17	4½	3½	Bridgeport, United States	11 11	8	6½
Bodkin Light, United States.	5 42	1½	1	Bridgewater (Bar) England	6 50	35	26½
Boerong Id., China Sea -	4 45	7		Bridlington, England -	4 39	16	12
Bojador Cape, Africa -	12 0	8?		Bridport, England -	6 5	11½	7½
Bolt Head, England -	5 45	15?	11?	Brielle, Netherlands -	3 0	5	
Bombay Dockyard, Hin- doostan, W. Coast.	11 40	12-17		Brig Bay, Newfoundland	9 46	5?	
Bonacca Id., Bay of Hon- duras.	9 0	1½		Brighton, England -	11 15	19½	16
Bonanza, Spain -	2 0	12½	8	Brisbane (Bar), Australia	10 4	6	4½
Bonavista, Newfoundland	7 25	3½	2½	Bristol (King Road) Eng- land.	7 13	40	31
Bonne Esperance Harb., G. of St. Lawrence.	9 15	5	2½	— Cumberland Dock Gates.	7 13	31½	
Bonny R. C., Africa, Wst.	5 0	9		Britannia Bay, Sumbawa	1 0	11-12	
Booby, Island, Australia, N. Coast.	4 30	8		British Sound, Mada- gascar, E. Cst.	4 0	9½	
Bordeaux, France -	6 50	14	12½	Broad Sound, Australia, E. Cst.	11 0	20-30	
				Broadhaven Har., Ireland.	5 0	10½	7½
				Broadway R. (entrance), China, E. Coast.	11 0	7½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Broken Bay, Australia, E. Coast.	8 0	6-9		Byron Bay, Australia, E. Coast.	9 45	6	
Broom Loch (Ullapool)	6 40	14½	10½	— Cape, Australia, E. Coast.	9 45	6	
Broughty Ferry, Scotland	2 22	14½	11	Cabifa Bay, New Gra- nada.	3 40	12	
Brouwershaven, Nether- lands.	2 15	10	8	Cacheo River, Africa, W. Coast.	7 45	8	
Bruit River, Borneo -	3 0	11		Cadiz, Spain - -	1 45	9½	
Bruni R., China Sea, E.C.	11 0	12		Caen, France - -	10 57		
Brunsbüttel, Germany -	1 58	9		Caermarthen (Bar) -	5 44	26	19½
Brunswick B., Australia, N.W. Coast.	12 0	24		Caernarvon, Wales -	9 33	13½	10½
Brush, Yarmouth, England		5½	4½	Caimites, St. Domingo -	8 0?	1?	
Bubon Point, Port Barton, China Sea, E. Coast.	10 55	6		Cairnlough, Ireland -	10 51	5½	5
Buctouche River, G. St. Lawrence.	3 30?	4?	2½?	Cajeli Bay, Bouro -	1 0	6	
Budehaven, England -	5 45	23	17	Calais, France - -	11 49	19½	15½
Buenaventura Port, Cen- tral America (Negrilla Reef).	4 0	13		Calbuco Beach, Patagonia, W. Coast.	1 15	16	
" off the town -	6 0	13		Calcasieu Fort, Patagonia, W. Coast.	1 18 or 0 47	18	
Buenos Ayres, S. America, E. Coast.*	12 0	3-5		— River, Gulf of Mexico.		2½	1½
Buffalo R. (East London), Africa, S. Cst.	3 43	5	3½	Calcutta, Bengal - -	2 30		
Bulama Island (Arcas Channel), Africa, W. Coast.	10 10	14	11	Caldy Road, Bristol Channel.	5 40	24?	16?
Bull Harbour, Goletas Channel, Vancouver Id.	0 30	12½		Calebar R., Africa, W. Cst.	5 0	9	
Bull Id., Newfoundland	7 22	3½	2	Caledonia Harbour, New Granada.	11 40	1½	1
Bulls Id. Bay, United States	7 16	5½	4½	Calf Sound, Isle of Man- Calicut Roads, Hindoostan, W. Coast.	11 17 12 15	16½ 4	18 3½
Bulls Mouth (Achill Sound, N. entrance), Ireland.	5 38	10½	7½	Callao Bay, Peru -	5 47	4	
Bulsar Khari, Hindoo- stan, W. C ast.	1 45	18	14½	Calshot (Castle Pt.), Eng- land.	11 30	13	9½
Buluagan O'sta Ana Port, Filipinas.	12 0	5½		Calstock, R. Tamar, Eng- land.	6 6	12½	8½
Bunawe (Loch Etive), Scotland.	7 54	5½		Camaguin, Babuyan, Ids.	6 0	6	
Buncranna, Ireland -	5 40	16		Camariñas Port, Spain -	3 0	15	
Bunessan, Scotland -	5 24	12	8½	Cambay (town), Hindoo- stan, W. Coast.	5 20	day 23 night 30	
Burburra, see Berbereh.				Cambing, Banda Sea, Camden Harb., Australia, N.W. Coast.	noon 11 30	6 30	
Burin Harbour, New- foundland.	8 45	6½	4½	Cameleon Harb., Nodales Channel, B. Columbia.	3 0	16	11½
Burntisland, Firth of Forth, Scotland.	2 24	16½	12½	Cameroon R., Africa, W. Coast.	4 0?	6	
Burnt Isles, Kyles of Bute, Scotland.	11 50	10	8	Campbell Cape, New Zea- land.	6 0	8	6
Burong I., see Boerong.				— Island, South Pacific.	12 0	3½	
Burrard Inlet, Gulf of Georgia, B. Columbia.	6 0	16		— Town, Gulf St. Lawrence.	4 0	10	7
Burry Port, Wales -	6 1	25½	18½	Campbellton, Scotland -	11 45	8½	6
Busainga, Burias Island	12 30	6		Campeche, Yucatan -	1 45	2½	2
Bushire, see Abú-shehr.				Campobello (Welchpool), B. of Fundy.	11 21	23½	20
Bussorah R. Bar, Persian Gulf.	12 0			Cancale, France - -	6 20	37	27
Button Islands, Hudson Strait.	6 50						

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds, and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Canna Id., Scotland, W. Coast.	h. m. 6 19	ft. 14	ft. 9½	Cascumpeque H., Prince Edward Island.	h. m. 5 40	ft. 3	ft. 2
Canso Gut (North entr.)	9 15	4	2	Cashla Bay, Ireland -	4 33	16	12
— (Plaister Cove), Nova Scotia.	9 10	4½	3	Casquets, English Channel	6 45	15½	
— Har., C. Breton Island.	7 48	6½	4½	Castillos, Cape, Rio de la Plata.*	8 30	2	
Cantin Cape, Africa -	10 0	10		Castlereagh Cape, Tierra del Fuego.	2 50	4	
Canton River (entrance), China.	10 0	8		Castletown, Bearhaven, Ireland.	4 14	9½	7½
Canton River } In Mar.	2 40	5½		— Isle of Man -	11 10	20	16
(Kuper Id.) }				Castletownsend, Ireland -	4 21	10½	8
— " } In May & June }	1 40	5½		Castors Harbour, Newfoundland.	10 50	5?	
Cape Coast Castle, Africa, W. Coast.	4 30	6		Castries B., G. of Tartary	10 30	6	
Cape May Landing, U.S.	8 19	6	5	Castro, Patagonia, W. Co.	0 11	18	
Caracas River, Ecuador -	3 30	10		Casuarina Point, China Sea, E. Coast.	9 30	6½	
Caracquette Harbour, G. of St. Lawrence.	2 40	6	3	Catalina Harbour, Newfoundland.	7 0	6	4
Carbonear, Newfoundland	7 20	4½	3	Catharina Sta. I., Brazil -	2 45	6	4½
Cardiff, (Penarth,) Wales	6 56	37½	29	Catharine St. Point, Magellan Strait.	8 5	30	
Cardigan, Wales -	7 1	12	9	Cato Bank, Australia, E. Coast.	8 0	6	
— Bay, Prince Edward Island.	8 40	5	3½	Catoche Cape, Yucatan -	9 30	1½	
Careening Bay, Australia, N. W. Coast.	11 45	30		Cattawade Bridge, Stour River, England.	1 8	4½	
Caremapu, Patagonia, W. Coast.	0 50	10		Cavalli Ids., New Zealand	8 0	7	
Cargados Carajos Shoals, Indian Ocean.	2 0	4		Cavern Id., China S., E.C.	9 30	5½	
Cargreen, R. Tamar, England.	5 47	14½	10½	Cawee Islands, Gulf St. Lawrence.	1 50	9	5
Caribou Harbour, Nova Scotia.	10 0	6	4	Cay West, United States — N.W. Channel, U.S.	9 30	1½	1½
Carleton Point, Gulf St. Lawrence.	3 0	6	4	Cayenne, Guayana -	3 45	6-11	1½
Carlingford (Bar or Cranfield Point), Ireland.	11 0	14	11	Cayeux, France -	11 5	27½	21
Carlisle Port, England -	12 10	20	14	Ceara, Brazil -	4 30	9	
Carlos, San, Port, Patagonia, W. Coast.	11 15	6		Cedar Cays, United States	0 51	3½	2½
— (Arenas Point) Patagonia W. Coast.	0 14	6		Cedeira, Spain, N. Coast	3 0	15	
— (English Bank) Patagonia W. Coast.	0 4			Centre Id., (Foveaux St.) New Zealand.	12 15	8	6
Carlos, San, Port, Falkland Islands.	7 0	8		Ceram, Wahaay Harbour, Moluccas.	6 0	3	
Carnot Bay, Australia, W. Coast.	0 30	13-14		Cerro Id., California -	9 10	7-9	
Carouge River, R. St. Lawrence.	7 15	16	11	Ceuta, Africa, N. Coast -	2 6	3½	½
Carrigaholt, Ireland -	4 44	14	10½	Chacachacara Id., Trinidad, Caribbean Sea.	3 30	4	
Carsaig, Scotland -	5 28	10	7½	Chacao Bay, Patagonia, W. Coast.	0 40	14	
Cartagena, New Granada	11 0	1½	1	— Narrows, Patagonia, W. Coast.	1 15	16	
Carteret, France -	6 25	31	22½	Chacuarama B., Trinidad	4 20	4	2½
— Port, New Ireland.		6		Chalky Inlet, New Zealand.	11 5	8	6
Carwar or Sedashigar Bay, Hindoostan, W. Coast.	10 0	6½	5	Chalmers Port, America, N. W. Coast.	1 0	13½	
				Chamé Bay, New Granada.	4 0	16	
				Chamisso Id., America, N. W. Coast.	4 42		

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Neaps.			Springs	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Champion Bay, Australia W. Coast.	9 10	1		Choiseul Port, Madagascar, E. Coast.	4 0	5	
Champlain R., St. Lawrence.	9 45	3	2	Chosan Harb. or Tsauliang-hai, Japan Sea.	7 45	7	5
Changchi Id., China, E. C.	9 30	17		Christchurch, England -	{ 9 0	} 5	
Changues Ids., Patagonia, W. Coast.	0 35			Christiansted, Santa Cruz.	{ 11 30		
Chapu Road, Hang-chu Bay, China, E. Coast.	12 0	25		Christmas Island, Indian Ocean.	7 30	2	
Charles Cape, United States.	7 45	5		Christmas Harbour, Kerguelen Id.	10 0		
Charles Id., Galapagos -	2 10	6		Chuen-pee Point, Canton River.	2 0	2	
Charleston, United States	7 26	6	5	Chusan Archipelago, (Vernon Channel,) China, E. Coast.	2 0	7½	
Charlowka R., Lapland	8 8	12		Chusan Tinghae, China, E. Coast.	9 40	14	
Chatean Bay, Labrador -	7 35	3½	1	Circular Head, Tasmania	11 0	12	9
Chatham, England -	1 11	18	14½	Clam Point, B. of Fundy	11 40	9	
—— Id., Galapagos	2 23	6½		Clara Sta., I., Ecuador -	8 27	8½	6½
—— (Port Hutt), S. Pacific.	6 50	6		Clare I., Ireland -	4 0	11	
—— Port, America, N. W. Coast.	1 0	12		Clarence Port, America, N.W. Coast	4 38	12½	9½
Chatte Cape, United States	12 0	13	8	—— Harbour, Long Island, Bahamas.	4 25		
Chauan Bay, China, E. Coast.	11 0	6½		—— River Heads, Australia, E. Coast.	8 30	4	3½
Chausey, Isles de, France	6 9	35	26	Clarke Harbour, Bay of Fundy.	9 0	6	4½
Cheduba, Bay of Bengal-Chee-fow Harb., Yellow Sea, see Chifu.	11 30	8		Clayoquot Sound, Vancouver Id.	8 40	9½	
Chentabun River, China Sea, W. Coast.	10 0	5½		Clear, Cape, Ireland -	12 0	12	7
Chepo River, New Granada.	3 40	16		Clearwater Point, Gulf St. Lawrence.	4 0	9	6½
Chepstow, England -	7 30	38	28½	Cleveland Bay, Australia, E. Coast.	11 30	5	3
Cherbaniani Reef, Laccadives, Indian Ocean.	10 0	7	4	Cley, England, N.E. Cst.		10-12	
Cherbourg, France -	7 49	17	12½	Clifden Bay, Ireland, W. Coast.	7 30	5½	
Chesilton, England -	6 13	10½	7	Clinch Fort, Fernandina, United States -	4 30	13½	10
Chester (Crane Wharf), England.	0 16	26		Clonakilty, Bay, Ireland	7 53	6½	6½
Chester River (Rockhall Creek), United States.	5 23	2½	1	Coacocho Bay, G. of St. Lawrence.	10 30	11	8½
Chesterfield Islet, Australia, E. Coast.	8 30	5		Cobija Bay, Bolivia -	4 30	5	3
Chetican, C. Breton Id. -	8 15	3½		Cocagne River, G. St. Lawrence.	9 54	4	
Chichester, England -	11 30	14	11	Cochin Harb. and Road, Hindoostan, W. Coast.	7 30?	4?	2?
Chifu, Yellow Sea -	10 34	8	6½	Cockburn Island (Antarctic Ocean).	1 30	2½	2
Chimmo Bay, China, E. Coast.	10 20	16		—— Port, Africa, E. Coast.	7 50	6	
Chimney Id., Rees Pass, China, E. Coast.	11 30	12		—— Australia, N. Coast.	4 15	12	
Chinchu Harb., China, E. Coast.	12 25	17		—— Sound, Australia, W. Coast.	5 45	24	
Chin-hae, Yung R., China, E. Coast.	11 20	12½		Cockenzie, Firth of Forth, Scotland.	9 0	1-1½	
Ching-tau Bay, Yellow Sea.	6 0	12	9		2 16	15½	13
Chipiona, Spain -	1 34	12½	8				
Chittagong (Bar), Bay of Bengal, E. Coast.	1 15	15	10				
Chodo Id., Korea, W. C.	6 20	12					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cod Cape, United States	11 30	13		Corunna, Spain -	3 0	15	
Codroy Island, New- foundland.	9 15	6	4	Coudres Id. (Prairie Bay), R. St. Lawrence.	4 25	17	10
Colorado River, La Plata	4 0	9	7½	Courseulles, France -	9 7	20	15½
Colarados, R. La Plata -	3 40	11		Courtmacsherry, Ireland	4 36	10½	8½
Cold Spring Inlet, United States.	7 32	5½	4½	Coverack, England -	4 35	14½	11½
Coleraine, Ireland -	6 24	6½	4	Cow Head Harbour, New- foundland.	10 41	8½	6½
Collier Bay, Australia, N.W. Coast.	11 45	36		Cowes (West), England	{ 10 45 11 45 }	{ 12½ 12½ }	{ 9½ 9½ }
Colne Point, Colne River, England.	12 0	14	10	Coy Inlet, Patagonia, E.C.	9 30	40	
Colombilla Cay, Pearl Cays, Caribbean Sea.	2 0	2		Coyhuin River, Chile -	0 52	21	
Colombo, Ceylon -	1 0	2		Cozumel, B. of Honduras	8 30	1½	
Colonsay (Schallasaig), Scotland, W. Coast.	5 18	11	7½	Crane Island, River St. Lawrence.	5 24	17	13
Columbia River, (entr.) America, N.W. Coast.	0 15	7½		Cranford Bay, Mulroy Bay, Ireland.	8 3.	4	
Componee River, Africa, W. Coast.	10 0	15	11½	Crapaud, Prince Edward Island.	10 0	8	6
Compu Inlet, Patagonia, W. Coast.	1 10	17	13½	Crichton Harbour, Korea, S. Coast.	9 50	11½	8½
Concarneau, France -	3 12	13	9½	Crimon Ids., Java Sea -	8 0	6	5
Condore, Cochin China -	3 0	4		Crinan, Scotland -	4 49	6½	5
Congo R., Africa W.C.	4 30	6		Croc Harbour, Newfound- land.	6 30	4½	
Congoon Bay, Persian G.	7 45	9½		Croisilles Harbour, New Zealand.	9 0	12	8
Conil, Spain -	1 18	11½	7½	Cromarty, Scotland -	11 56	14	11
Conquet Road, France -	3 46	21	15	Cromer, England -	7 0	14½	11
Constitucion Cove, Bolivia	10 0	4		Crow Harb., Nova Scotia	8 0	6½	4½
Conway Cape, Australia, E. Coast.	11 0	18		Crowdy Head, Australia, E. Coast.	9 15	5	3
Cook Harb. Newfoundland	7 25			Crooked Id., Bahamas -	7 0	2½	
Coondee, <i>see</i> Kúdi.				Crookhaven, Ireland -	4 9	9½	9
Cooper Port, New Zealand.	3 50	7½	5½	Cucao Bay, Patagonia, W. Coast.	12 0	6	
Copiapo, Chile -	8 30	5		Cuckolds Point, River Thames, England.	1 45	19?	15?
Coquet Rd., England, E.C.	3 0	14½	11	Culdaff Bay, Ireland, W. Coast.	5 53	8½	6
Coquimbo Bay, Chile -	9 8	5		Culebra or Passage Id., Caribbean Sea.	9 0	1	
Cordonan Lthse., France	3 37	13½	10½	Culiacan River, Mexico, W. Coast.	11 30	6?	
Corentyn River, Guayana	5 10	8½	6	Cullen Harbour, Fife Sound, B. Columbia.	12 0	16	11½
Coringa or Cocanada Bay, Bay of Bengal, W. C.	9 10	4-5	3	Cullin Id., Patagonia, W. Coast.		20	
Coringa R. (Bar), Bay of Bengal, W. Coast.	9 0	5		Culpepper Id., Galapagos	?	?	
Corisco Bay (Elobey Isles), Africa, W. Cst.	5 0	7		Cumberland Basin, (Sack- ville) Bay of Fundy.	11 55	45½	33
Cork (Penrose Quay), Ireland.	4 58	12½	10	Cumsingmun Harbour, Canton River, China.	12 6	6½	
Corn Ids., B. of Honduras	1 45	2		Cupchi Point, China, E. C.	8 0		
Corner Inlet, S. Australia	11 40	8		Cupica Bay, New Granada	3 30	13	
Cornwall, Cape, England	4 35	18?	13?	Curieuse, Seychelles, In- dian Ocean.	5 10	7	
Corny Point, Australia, S. Coast.	2 45	4		Curtis Port, Australia, E. Coast.	9 40	10-12	
Corpach (Loch Aber), Scotland.	5 59	11½		Cuttyhunk, United States	7 40	4½	3½
Corran (Loch Aber), Scotland.	5 43	12	8½				
—— Loch Linnhe, Scotland.	6 37	14½					

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		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cutwell Harbour, New- foundland.	7 0?	2-4?		Deoghur Harbour (en- trance), Hindoostan, W. Coast.	11 0	9	7
Cuxhaven, Germany -	1 8	10		Depuch Isle, Australia, W. Coast.	10 40	14	
Cuyler Harb., California	9 25	5	4	Desire Port, Patagonia, E. Coast.	12 10	18½	
Cypress Harbour, Sharp Passage, B. Columbia.	12 0	16	11½	Devarenne Strait, New Caledonia.		3½	
Daggs Sound, New Zea- land.	11 30	8	6	Devonport Dockyard, England.	5 43	15½	11½
Dahouet, France -	6 5	32	23½	Dhardur R. (entrance), Hindoostan, W. Coast.	4 30	27	20-22
Dalawan Bay, China Sea, E. Coast.	11 0	5		Dheli River, Sumatra -	3 0	8	
Dalcahne, Patagonia, W. Coast.	0 26			Diamond Island, Bay of Bengal.	10 30	8	
Dalhousie Harb., G. St. Lawrence.	3 10	9		—— Point, Malacca Strait.	12 0	9½	
Dalkey Island, Ireland -	10 45	13	11	Diego, San, Bay, Cali- fornia.	9 38	5	3½
Dalrymple B., Madagascar W. Coast.	5 0	15		Diego, San, Cape, Tierra del Fuego.	4 30	10	
——— Prt., Tasmania	12 5	10	7½	—— Garcia Island, Indian Ocean.	1 30	6	
Dampier Strait, Moluccas		11		—— Ramirez Ids., Tierra del Fuego.	4 0	6	
Danes Island, Spitzber- gen.	0 24	5½		Dielette, France - -	6 40	27	20½
Danger Point, Australia, E. Coast.	9 30	6	4½	Dieppe, France - -	11 6	27	20½
Darnley Id., Torres Strait	9 30	12		Digby Gut, B. of Fundy	11 0	27½	23
Darra Salaam, Africa, S. Coast.	4 0	12		Dilhi or Dielli, Timor -	1 0	6	
Dartmouth, England -	6 16	14½	10½	Dillon Bay, Erromango Id., Banks Ids.	5 30	4	
Darwin H., Choiseul Id., Falkland Islands.	6 30	5½		Dingle, Ireland -	3 51	10½	7½
Darwin Port, Australia, N. Coast.	5 30	17-24		Direction Hill, Magellan Strait.	8 53	23-38	
Dauphin Fort, Madagascar	4 30	7		Discovery Port, America, N. W. Coast.	2 30	7	
De Roompot, North Sea	12 30	12	8	Dislocation Harb., Tierra del Fuego.	1 40	4	
Deal, England - -	11 15	16	12½	Diu Harb., Hindoostan, W. Coast.	11 0	6	4½
Dealy Id., Melville Id. -	1 48	4		Dives, France - -	9 39	21	16
Deep Harbour, Fife Sound, B. Columbia.	12 0	16	11½	Divy Pt., Bay of Bengal		5	
—— Point, Durian Strait	5 0	10		Doboy Lighthouse, U. S.	7 33	7½	7
Deer Harb., Newfoundland	7 49	3½	2	Dodandowe Bay, Ceylon	1 50	1½	
—— Sound, Orkneys -	10 30	10	7½	Dodo R., Bight of Benin	4 17	5	
Delagoa Bay (Port Mel- ville), Africa, S. Coast.	4 30	15		Domingo, San, Port, Pa- tagonia, W. Coast.	12 0	7	
Delagoa Bay (Portu- guese Factory), Africa, S. Coast.	5 20	12		Domino Run, Labrador -	6 40?	6?	4?
—— Shefeen Id., Africa, S. Coast.	4 40	12		Donaghadee, Ireland -	11 13	11½	9
Delaware (Breakwater), United States.	8 0	4½	3½	Donegal Harb., Ireland -	5 18	11½	8½
Delftzyl, Germany -	11 15	8-10		Doris Cove, Tierra del Fuego.	3 0	4	
Delgado C., Africa, E. C.	4 0	16	11½	Dornock Road, Scotland	11 47	11	
Demerara R., Guayana -	4 45	9	6	Douany, Comoro Ids.	4 0	11-12	
Denham Sound, Sharks Bay, Australia, N.W. Coast.	12 5	5		Douglas, Isle of Man -	11 12	20½	16
Denial Bay, Australia, S. Coast.	12 15	6		—— Road, Bahamas -	8 30	4	2½
Denison Port, Australia, E. Coast.	9 30	6		Dover, England -	11 12	18½	15
				Downham Reach, Orwell, England.	12 27	12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Dragons Mouths (Boca-Grande), Caribbean S. Monos).	3 30	4	2½	Eides Fiord, Faeroe Ids.	11 0	9½	7½
Drakes Bay, California -	3 50	4	2½	Eigg Id., Scotland -	6 15	14	10
Drayton Harb., St. Juan de Fuca Strait.	11 41	4½	3½	Elbe, Entrance, Germany	12 0	11	
Drogheda (Bar), Ireland	2 0	12		Elena Sta., Port, Patagonia, E. Coast.	4 0	17	
Duart, Isle of Mull -	11 0	11½	9	Bay, Ecuador -	1 18	8	
Dubba River, Hindoo-stan, W. Coast.	5 0	12	10	Elizabeth Bay, Africa, S. W. Coast.		5-6	
Dublin (Bar), Ireland -	10 10	8		Ellen Port, Islay -	5 0	5	4
Dumbarton, Scotland -	11 12	12-14	9-11	Ellenwoods Anchorage, Bay of Fundy.	9 54	13	10½
Dunbar, Scotland -	0 20	9		Elliot Port, Australia, S. C.		5-6	
Dunbeacon, Ireland -	2 8	14½	11	Emden, Germany -	12 0		
Duncan Bay, N. W. Coast of America.	3 51	10½	7½	Ems River, (outer buoy), Germany.	10 0	8-10	
Duncansby Ness, Scotland.	12 0	21		Encounter Rock, Yellow Sea.	10 44	11	8
Dundalk, Ireland -	10 14	8½	6	Endeavour R., Australia, N. Coast.	8 0	5-10	
Dundee, Scotland -	10 56	13½	11½	Strait, Australia N. Coast.	1 0	9½	
Dungeness, England -	2 32	14½	11½	Endermo Harbour, Japan	5 30	6	
Magellan St.	10 45	21½	19	English Bank, San Carlos, Patagonia, W. Coast.	0 4		
Dunk Id., Australia, E. C.	8 30	27-30		English Harbour, Antigua		2	
Dunkerque, France -	9 28	6-10		English R., Delagoa Bay, Africa, S. Coast.	7 30	5	
Dunkerron, Kenmare R., Ireland.	12 8	16½	13½	Enora Bay, Japan Sea -		4	
Dunmanus Harb., Ireland	3 45	10½	8	Eran Bay, (Palawan) China Sea, E. Coast.	10 10	6½	
Dunmore, Ireland -	3 57	9½	7½	Erebus Bay, Barrow Strt.	12 6	8	
Durnford Port, Africa, E. Coast.	5 27	12½	9½	Erme River, Bigbury Bay, England.	5 40	16½	11½
Dusky Bay, New Zealand	4 45	12		Erqui, France -	5 59	33½	24½
Dvina (Bar), White Sea				Erronan or Futuna, S. Pacific.	7 24	4	
Dyer Id., Africa, S. Cst.	11 15	10	8	Escumenac, Pt., Gulf St. Lawrence.	4 10	4	2½
Easdale Sound, Scotland	2 50	5		Esperanza Inlet, Vancouver Id.	12 0	12	
Easter Id., South Pacific	5 10	10-12		Espirito Bay, Brazil -	3 0	4	
East Cape, New Zealand	2 0	7		Espirito Santo, C., Magellan Strait.	8 30	36-42	
Point, Prince Edward Island.	8 55	3½	2	Esquimalt, St. Juan de Fuca Strait.*	irr.	7-10	5-8
Alligator River, Australia, N. Coast.	8 30	15		Essington Port, Australia, N. Coast.	3 24	13	
London, Africa, S. C.	8 15	5	3½	Estevan, San, Port, Patagonia, W. Coast.	0 15	5	
Eclipse Harbour, Labrador.	3 43	5		Etches Port, America, N. W. Coast.	1 15	9½	
Ecrehous, France -				Evangelista, Patagonia, W. Coast.	1 0	5	
Eddystone Pt., Australia, E. Coast.	6 32	31	22½	Exmouth, England -	6 21	12½	8½
Eden Harbour, Patagonia, W. Coast.	9 39	7		Exuma, Bahamas -	7 20	2½	
Edgar Port Falkland Is.	12 30	5		Eyemouth, Scotland -	2 15	15½	11½
Edgartown, United States	7 15	6	2	Eyre Port, Australia S. C.	10 30	6	
Edina, Africa, W. Coast	12 16	2½		Fair Isle, Shetlands -	11 0	5	3
Edmonstone, Id., Sherbro River, Africa.	5 50	4	8	Fairy Port, Australia, S. Coast.		4	
Egg Id. Lt., United States							
G. St. Lawrence	9 4	7	5½				
Egmont Bay, Prince Edward Island.	2 0	11	6				
Port, Falkland Islands.	3 0	4	2				
	7 30	11					

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Falkland Sound (N. entrance), Falkland Ids.	6 45			Fleetwood Wyre Light -	11 11	27	20½
(S. entrance)	7 0			Flesh Bay, or Bay St.	8 30?	6?	
Fall Harbour, Labrador -	6 40	3½		Bras, Africa, S. Coast.			
Falmouth, England -	4 57	16	12	Fleur de lis Harb., New-	7 15	2-4	
False Point, Bay of Bengal,	8 0	8		foundland.			
W. Coast.				Flinders Group, Australia,	9 15	8-12	
Famine Port, Magellan	12 0	6		E. Coast.			
Strait.				Florida Cape, United	8 36	1½	1½
Fane Id., Plumper Sound,	irr.	12		States.			
Oregon.				Flushing, Belgium - -	1 20	15	
Fannings Id., S. Pacific -		4		Fog Ids., Hang-chu B.,	11 45	17	
Fanny Hole, Mulroy Bay,	6 17	9½	8	China, E. Coast.			
Ireland.				Fogo Id., Newfoundland	7 20	4	
Fansiak Channel, Canton	1 0	7½	5	Folkstone, England -	11 7	20	16½
R., China, E. Coast				Folly Point, Petitcoudiac	11 49	45	38
Farallon, South, California	10 37	4½	3½	River, B. of Fundy.			
Fareham (close to the	11 48	11½	8½	Fongwhang Group (Bul-	8 30	17	
Upper Quay), England.				lock Harb.) China W.C.			
Bridge, Eng-	11 51	7½	4½	Forçados River, Bight of	4 22	5	
land.				Benin.			
Farewell, Cape, New	9 20	14	10	Fore carreeh R., Africa,	7 40	11	
Zealand.				W.C.			
Fatsizio, Japan Sea -	6 0	5		Formby Point, England -	10 35	28	
Fayal, Azores, Atlantic	11 45	4		Formosa Mt., Malacca St.	8 0	11	8½
Ocean.				Fort Dauphin, St. Domingo	7 0	5½	3½
Fear, Cape, River,	7 19	5½	4½	Fortune Bay, Patagonia,	0 50	7	
United States.				W. Coast.			
Fécamp, France -	10 44	23½	18	Forward Harb., British	3 0	16	11½
Fénérine, Madagascar -		3½		Columbia.			
Fenit, Tralee Bay, Ireland	4 3	12½	9½	Foulness, Crouch River,	12 5	14½	10½
Feolin Ferry, Jura -	4 41	6½	4½	England.			
Fernandina, Clinch Fort,	7 53	6½	6½	Fowey, England - -	5 14	15	11½
United States.				Fowlers B., Australia, S.C.	10 30	6	
Fernando Noronha Island,	4 0	6		Fox Bay, Falkland Ids. -	7 0	6	
S. Atlantic.				Foyle Lough (Warren-	6 20	6½	5
Po, Bight of	4 0	7		point), Ireland.			
Biafra.				Foynes Island, Ireland -	5 35	15½	12
Ferole Cove, New, New-	10 50	5?		France, Port de, or Nou-	8 25	4	
foundland.				mea Bay, N. Caledonia.			
Harb., Old, „	9 28	4½-6½		Francis, St., Bay, Tierra	4 0		
Ferribly Sluice, River	6 41	20½		del Fuego.			
Humber.				— Cape St., Africa,	3 34	5	
Ferro, Canary Ids. -	12 30?	9?		S. Coast.			
Ferrol, Spain - -	3 0	15		Francisco, San (North	12 6	4½	3½
Ferry Side, South Wales	5 49	23	16½	Beach), California.			
Filey Bay, England -	4 20	16	12½	Fraser River (entrance),	6 30	7-10	
Finisterre, Cape, Spain -	3 0			British Columbia.			
Fish Hd., G. Manan, Bay	11 16	22½	18½	Fraserburgh, Scotland -	0 40	11	8½
of Fundy.				Frechette Id., River St.	8 0	14	9
Fishguard, Wales -	6 56	11½	8½	Lawrence.			
Fitz-Roy Id., Australia,	9 15	7-12		Frederick Reef, Aus-	8 0	6	
E. Coast.				tralia, E. Coast.			
Fitzroy Port, Falkland I.	4 45	6		Frederickshaab, Green-	6 3	12½	9½
Flamand Bay, St. Domingo	irr.	2-3?		land.			
Famborough Hd., England	4 30	16	12	Freycinet Estuary -	4 15	3½	
Flamenco Port, Chile -	9 10	5		— Reach, Sharks	3 0	5	
Flatholm Ids., Bristol	6 54	37?	28?	Bay, Australia N.W.			
Channel.				Coast.			
Fleetwood Port, England	11 12	26½	19½	Friederichstadt, Denmark	2 37	9	
				Frio Porto, Brazil -	2 40	4½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Froward Cape, Magellan Strait.	1 0			Ghubbet, Gollonsir, Sokotra, Indian Ocean.	7 20	8	
Fugloe Fiord, Faroe Ida.	11 15	6½	4½	—— Hashish, Arabia, S.E. Coast.	10 0	10	
Funchal Bay, Madeira -	12 48	7		Gibraltar (old Mole), Spain.	2 20	3½	
Funk Id., Newfoundland	7 0?	2-3?		Gigha Sound, Scotland -	2 22	4	2½
Fury Cove, Patagonia, W. Coast.	1 15			Gijon Bay, Spain, N. Cst.	3 0	14	11
—— Harbour. Tierra del Fuego.	2 30	4		Gilmorris Id., Africa, W. Coast.	6 0	11	
—— Id., Tierra del Fuego	2 30	4		Gizri River, Hindoostan, W. Coast.	9 45	10	
Fury and Hecla Strait, Arctic Regions.	7 0	8		Glasgow, Scotland - -	1 25	9	7½
Gaboon R., Africa, W.C.	5 30	7	5	—— Port, Scotland -	0 18	9	
Gallant Port, Magellan Str.	9 0	5½		Glenan Iles, France -	3 12	13	10
Galle, Pointe de, Ceylon, S. Coast.	2 0	2		Gloucester Cape, Tierra del Fuego.	1 30	5	
Gallegos Port, Patagonia, E. Coast.	8 50	46		—— Harbour, United States.	11 4	10½	8½
Gallinas R., Africa, W. C.	6 45	4		Gluckstadt, Germany -	3 9	10	
Galloway (Mull of) -	11 15	15?	12?	Goa Bay, Hindoostan, W. Coast.	10 30	7	5½
Galong Bay, Hainan Id., China Sea.		4-5		Goapnath Point, Hindoostan, W.C.	2 25	18	13½
Galveston, G. of Mexico		1½	¾	Godbout River, Gulf St. Lawrence.	1 52	11	6
Galway, Ireland - -	4 35	14½	11	Goeree Island (West Gat) North Sea.	1 45	7	
Gambia R., Africa, W.C.	8 10	6-9		Gogah, Hindoostan, W. Coast.	3 50	27-30	21
Gambier Ids., Australia, S. Coast.	2 0	5		Gold Stream Harbour, N.W. Cst. of America.	1 0	15	12
Garliestown, Scotland, W. Coast.		17	12	Golovnin Bay, America, N. W. Coast.	6 23	3½	
Garroch Head - -	11 49	10		Gomera, Canary Ids. -	12 45?	9?	
Gaspé Basin, Gulf St. Lawrence.	2 40	5	3	Gometra, Loch Tuadh, I. of Mull.	5 29	11½	8
Gay Head, United States	7 37	7		Gonaives Bay, St. Domingo	8 0	1	
Geby, Fohou Id., Gilolo Passage, Moluccas.		5		Good Bay, Newfoundland.	10 40	7½	5½
Geelong Harbour, Australia, S. Coast.	2 30	3½	2½	Goods Bay, Patagonia, W. Coast.	0 30	7	
George Cape, Nova Scotia	9 15	4	2	Good News, B. America, N. W. Coast.	6 15	13½	
—— d'Elmina, St., Africa, W. Coast.	4 30	6		Good Success Bay, Tierra del Fuego.	4 3	6-8	
—— Port, B. of Fundy	11 17	32	28	Goold Island, Australia, E. Coast.	6 45	6	
—— St., Basin, Australia, N. W. Coast.	12 20	24-37		Goole, River Humber, England.	7 26	13	
—— Shoals, United States.	10 30	7		Gooria Creek (entrance), Hindoostan, W. Coast.	11 0	8½	
—— St., Harb., Newfoundland.	10 3	6½	4½	Goose Cove, Newfoundland.	7 0?	2-3?	
Georges Bay, Tasmania	9 42	3	2	Gorda Sound, Virgin Islands.	8 30	1½	
Georges, St., Sound, G. of Mexico, middle entrance.	1 31	1½	1½	Gore Port, New Zealand	9 0	8	6
—— west entrance	irr.	2½-4		Gorée, Africa, W. Coast	7 45	2½	
Georgetown, United States	8 40	4½	3½	Goree Road, Tierra del Fuego.	4 0	8	
—— South Island, United States.	7 56	4½	3½				
Geriah or Viziadroog, Hindoostan, W. Coast.	11 0	9	7				
Germain St., France -	6 20	34	25				
Ghubbet Ne, Sokotra, Indian Ocean.	7 0	7					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Goulburn Ids., Australia, N. Coast.	6 0			Griffith I., Barrow Strait	12 15	3 $\frac{3}{4}$	2 $\frac{3}{4}$
Goury, France - -	7 6	22	17 $\frac{1}{2}$	Griguet Bays, Newfound- land.	7 0?	2-3?	
Gowlland Harbour, Dis- covery Passage, Van- couver Id.	5 30	11		Grimsby, England -	5 36	19 $\frac{1}{2}$	15
Gracias, Cape, Harbour, Bay of Honduras.	10 30	2		Grindstone Island, Bay of Fundy.	11 47	41	34 $\frac{1}{2}$
Grand Cestos, Africa, W. Coast.	5 20	4		Grisnez Cape, France -	11 27	21 $\frac{1}{2}$	16 $\frac{3}{4}$
— Harb., Gd. Manan, Bay of Fundy.	11 7	21	17 $\frac{1}{2}$	Grondine, R. St. Lawrence	9 0	9	6
Grand Lahou, Africa, W. Coast.	4 20	4		Gruinard Island, W.C. of Scotland.	6 37	14 $\frac{1}{2}$	
Grand Passage, B. of Fundy.	10 43	20 $\frac{3}{4}$	17	Guambacho Bay, Peru -	6 30	2	
Grand Port, Mauritius -	1 0	1 $\frac{1}{2}$		Guardafui Cape, Africa, E. Coast.	6 15	6	
— Rustico, Prince Edward Island.	6 40	4	2	Guarmey Bay, Peru -	6 10	2	
Grande-digue, Madame I., Cape Breton Id.	7 55	6 $\frac{1}{2}$	4 $\frac{1}{2}$	Guatulco, Mexico, W. C.	1 30	5	
Grande Point, Chile -	9 45	5		Guayaquil, Ecuador -	7 0	11	
Granton Pier, Scotland -	2 20	16	12 $\frac{1}{2}$	Guaymas, Mexico, W. C.	8 0	4	
Granville, France -	6 13	37	27 $\frac{1}{2}$	Guernsey, (St. Peter Port,) English Channel.	6 37	26	18 $\frac{3}{4}$
Gravelines, France -	12 0	19	15	Guia Narrows, Patagonia, W. Coast.	2 10		
Graves Port, Howe Sound, Gulf of Georgia,* British Columbia.	noon	12		Guinchos Kay, Bahamas	7 40	3	
Gravesend, England -	1 10	17 $\frac{1}{2}$	14	Gun Cay, Bahamas -	8 30	3	
Great Barrier, Id. (Nagle Cove), New Zealand.	6 25	10	7	Gundavi R. (entrance), Hindoostan, W. Coast.	2 0	19	15 $\frac{1}{2}$
Great Barrier Reef, Aus- tralia, E. Coast.	8 48	7		Gunfleet Sand, England -	11 40	12	8
Great Fish Bay, Africa, W. Coast.	2 30	5-6?		Gutzlaff Id., China, E. C.	11 30	15	
Great St. Lawrence Harb., Newfoundland.	8 30	7	4	Guysborough, Nova Scotia.	8 20	6 $\frac{1}{2}$	4 $\frac{1}{2}$
Greatman Bay, Ireland	4 39	15 $\frac{1}{2}$	11 $\frac{1}{2}$	Gweedore (Bunbeg), Ire- land.	5 32	11	8
Green Island, River, St. Lawrence.	2 45	16	9 $\frac{1}{2}$	Haarlem, Netherlands -	9 0		
Greencastle Point, Ire- land.	11 2	14	11 $\frac{1}{2}$	Habitable Id., Lapland -	7 9	9	
Greenock, Scotland -	12 8	9 $\frac{3}{4}$	8 $\frac{1}{2}$	Habitants Harb., C. Bre- ton, Id.	8 20	6 $\frac{1}{2}$	4 $\frac{3}{4}$
Greenwich, England -	1 43	19	15	Haïti Cape, St. Domingo	6 0	3	
Greens Harbour, New- foundland.	6 44	3 $\frac{1}{2}$		Haiyun-tau, (Thornton Haven), Yellow Sea.	9 30	12	8
Gregory Bay, Magellan Strait.	9 45	23		Hajamri River, Hindoo- stan, W. Coast.	9 40	8	
— Port, Australia, W. Coast.	11 30	3		Hakluyt Head, Nova Zembla.	1 30	4	
Grenada (St. George Harb.), Caribbee Ids.	2 40	1 $\frac{1}{2}$	$\frac{3}{4}$	Hakodadi Harb., Yezo Island, Japan.	5 0	3	
Grenadines, Caribbee Ids	3 0	1 $\frac{1}{2}$	1	Halifax, Nova Scotia -	7 49	6	5
Grey Port, Swan River, Australia, W. Coast.	9 0	1-1 $\frac{1}{2}$		Halt Bay, Patagonia, W. Coast.	0 30	8	
Grey River, New Zealand	10 15			Hamburg, Germany -	5 29	6 $\frac{1}{2}$	
Greytown, Mosquito Cst.	9 0	1 $\frac{1}{2}$		Hamilton Port (Korea), Yellow Sea.	8 30	11	
Gribanika Pt. White Sea	4 50	3		Hammelin Pool, Sharks Bay, Australia, N.W. Coast.	5 0	3 $\frac{1}{2}$	
Griffin Bay, Haro Archi- pelago.	irr.	12		Hammerfest, Norway -	1 10	9	
				Hammond Knoll, Eng- land, E. Coast.	7 40		
				Han-kau, China, W. Coast		33-38	
				Hang-chu Bay (Seshan Ids.), China, E. Coast.	11 45	14	
				— (Fog Ids.) -	11 45	17	

* From observations made in the month of October.

N

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hang-chu B. (Chapoo Rd.)	12 0	25		Hellevoetsluis, Nether-	2 30	8	6
— off Can-pu -		32		lands.			
Hanover Bay, Australia,	11 30	24-38		Henlopen Cape, United	8 0	4½	
N.W. Coast.				States.			
— Sound, Bahamas	8 15	4	3	Henry Cape, United States	7 40	4	
Hanstul (mouth), Gulf	2 0			Henry Port, Patagonia,	12 0	5	
of Kutch, Hindoostan.				W. Coast.			
Hants Harbour, New-	7 13	4	3	Hernando Id., Strait of	6 0	12-14	
foundland.				Georgia, B. Columbia.			
Harbour of Mercy, Ma-	1 22	4		Hermite Isle, Australia,	10 0	14	
gellan Strait.				W. Coast.			
Harbour Grace, New-	7 25	4½	3	Heron Islet, Capricorn	9 0	10	
foundland.				Group, Australia, E. C.			
Harbour Id., Nova Scotia	7 40	6½	4½	Herradura Port, Chile -	9 8	5	
Hardy Port, New Zealand	9 55	8	6	— Nicoya Gulf -	3 9	10	
Haro Strait (Channels	irr.	10-12		Hesquiat Harbour, Van-	12 0	12	
leading to, from St.				couver Id.			
Juan de Fuca Strait).				Hewett Bay, Tierra del	0 30	6½	
Harrington Port, England	11 5	26	19	Fuego.			
Hartlepool, England -	3 28	15	11½	Heybridge, Blackwater,	12 20	12	8
Harvey Prt. (Call Creek),	0 30	10		River, England.			
Vancouver Id.				Hie-chechin Bay, China,	7 0		
Harwich, England -	12 6	11½	9½	E. Coast.			
Hastings, England -	10 53	24	17½	Hicks Bay, New Zealand	9 0	7	
— Harbour, Bay of	10 40	13½		Hierting, Jutland -	2 45	5	
Bengal, E. Coast.				Higbees, Cape May,	8 33	6½	5½
Hatling Bay, Moluccas -	6 0	3-4		United States.			
Hatteras Inlet, United	7 4	2½	2	Hillsborough R., Char-	10 45	9½	8
States.				lottetown, Prince			
Haute Isle, Bay of Fundy	11 21	33	28½	Edward Id.			
Havana, Cuba -	8 14	3		— (Head of R.)	11 0	10	7
Havannah Harb., Sand-	7 15	4		— Island (New	11 32	3½	
wich Id., Banks Ids.				Port), Bonin Islands.			
Haverfordwest, Wales -	6 42	7½	2½	Hillswick Firth, Shetland	9 45	6½	5
Håvre, France -	9 51	22	18	Hilton Head, United States	7 19	7½	6½
Hawke B., New Zealand	7 50	3		Hiogo Bay, Japan Sea -	7 15	5½	4½
Hearts Content, New-	7 30	4	2½	Hirtshals, Jutland -	4 28	1	
foundland.				Hobarton, Tasmania -	8 15	4½	3½
Héaux Lights, France -	5 45	31	23½	Hoe-e-tow Bay, China, E.	2 15	16	
Heawandou Pholo Atoll,	9 30	5		Coast.			
Maldives.				Hokianga R. (entrance),	9 45	10	
Heda Bay, Japan Sea -		5½		New Zealand.			
Helena St., Bay, Africa,	2 30	6		Hokianga R. (Kokohu)	10 15	10	7
W. Coast.				New Zealand.			
— Id., S. Atlantic	3 11	3		Hokitika (Bar) New Zea-	9 39	8½-9	
— St. Sound, U. S.	7 8	7½	6	land.			
Helford, England -	4 43	15½	11½	Hollesley, England -	11 30	8½	6½
Helgoland, German Ocean	11 33	9½	7	Holmes Hole, U. States -	11 43	1½	1½
Helier, St. Jersey, English	6 36	31½	23	Holsteinborg, Greenland	6 30	10	
Channel.				Holy Island, England -	2 30	15	11½
Hell Gate Approaches,				Holyhead, Wales -	10 11	16	13½
United States.				Hon-cohe Bay, China	11 30	5	
— Long Id.,	9 59	6	5½	Sea, W. Coast.			
(Blackwells Dock).				Hondeklip Bay, Africa,	2 30	5½	
— N. of Astoria	9 48	6½	5½	S.W. Coast.			
Ferry.				Honfleur, France -	9 29	23½	16
— Pot Cove,	10 48	8½	6½	Honghai B., China, E.	10 0	6½	
(S.E. part).				Coast.			
— Wards Id.,	10 9	6½	5	Honoruru, Sandwich Ids.	4 0	2	
(Paupers Dock).				Hongkong, China, E. C.	10 15	4½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hoogly R., (W. entrance), Bay of Bengal, W.C.	10 0	10½		Indefatigable Id., Galapagos.	1 56	6	
—— Kedgeriee to Diamond Harbour.		18*		Independencia Bay, Peru	4 50	4	
Hooper Id., Korea, S.C.	9 10	11½	8½	Indian Cay, Florida -	8 23	2½	1½
Hope Harb., Falkland Ida.	8 10	7		—— Tickle, Labrador -	6 37	6	4
—— Sound (Mia-u-tau Group), Yellow Sea.	10 24	6½		Indus (Gizree Bunder), Hindoostan, W. Coast.	9 50	7	
Hopedale, Labrador -	5 38	7	4	Inhambane R., Africa, E.C.	4 15	10	
Horn Cape, Tierra del Fuego.	4 40	9		Inishbofin, Ireland -	4 34	12½	9½
Horn or Blaavand Point, Jutland.	1 44	5		Inishkeel, Ireland -	5 10	11	8
Horton Bluff, B. of Fundy	12 30	48	40	Inishturk, Ireland -	4 36	12½	9½
Hougue La, France -	8 42	18½	14½	Inkanskie, White Sea -	9 15	14	
Hourdel, France -	11 26	27½	21	Inman Cape, Tierra del Fuego.	2 0	4	
Hout B., Africa, W. Cst.	2 20	5		Intsi Point, White Sea -	11 55	16	
Houtman Rocks, Australia, W. Coast.	11 30	2½		Inverary, Scotland -	12 0	10	
Howden, R. Tyne, England.		12		Inverness, Scotland -	12 18	12	9½
Howe, West Cape, Australia, S. Coast.	9 0	6		Investigator Rd., Australia, N. Coast.	8 0	9	
Howth Harbour, Ireland	11 9	13	10	Iona Sound, Scotland -	5 11	11½	8½
Huacho Bay, Peru -	4 45	3		Ipswich, England -	12 35	13½	
Huafu Islands, Patagonia, W. Coast.	12 0	7		—— United States -	11 26	10½	8½
Huapilinao Hd., Patagonia, W. Coast.	1 25	15½		Iquiqui Road, Peru -	8 45	5	
Huasco Port, Chile -	8 30	6	4	Ireland Id., Bermudas -	7 4	4	
Hui-ling-san, China, S.C.	8 15	7½		Isidro St., Cape, Magellan Strait	1 0	8	
Huillard Inlet, Patagonia, W. Coast.	0 48	16-20		Island Harbour, Choiseul Id., Falkland Islands.	5 20	6	
Hu-i-tau Bay, China, E. Coast.	12 15	16		—— Country Harbour, Nova Scotia.	7 40	6½	5½
Hull, England -	6 29	20½	16½	Islay, Peru -	8 53	7	
—— Bridge, Crouch R., England.	12 25	16	11	Isle-aux-Coudres, R. St. Lawrence.	4 25	17	10
Hulu Shan B., Yellow Sea	2 30	8	6	Isles de Los, Africa, W. C.	6 35	13	
Humboldt Bay, California	12 2	5½	4½	Isolette Cape, Arabia, S.E. Coast.	9 0	10	
Hungry Point, Australia, S. Coast.†	4 18	7	4-6	Ives, St., England -	4 44	21	15
Hunter Id., Bass Strait -	11 30	8		Jacinto, Port San, Ticao Id. Filipinas.	6 30	6	
Hunter Port, Australia, E. Coast.	9 45	6-7		Jackson Port (N. Head), Australia.	8 15		
Hurst (Camber), England	{ 10 0 } { 12 0 }	{ 7½ }	6	Jacmel, St. Domingo -	irr.	2-3?	
Husum, Denmark -	2 36	9		Jafrabad, Hindoostan, W. Coast.	11 35	9	7
Hyannis, United States -	12 22	4	3	James Id. (Adam Cove), Galapagos.	2 14	5	
Icacos Point, Trinidad -	4 14	7	4	—— N. side, Galapagos.	2 34	5	
Ichabo Id., Africa, W. Coast.	1 0	6	4	James Id., W. end, Galapagos.	3 10	5	
Iengen, New Caledonia -	6 15	4½		James R. (City Point) U.S.	2 11	8	2½
Ilfracombe, England -	5 42	27½	21½	Jashk Shoal, Persian Gulf	9 30	8	
Iki, Japan Sea -		8		Jask Cape, Persian Gulf	6 0	6	
Ilha Grande, Brazil -	12 30	5	4	Jebogue, Bay of Fundy-	10 4	15	11½
Ilheo, Port d', Africa, W. Coast.	3 0	8-10		Jedore, Nova Scotia -	7 45	6½	4½
Iliolo Port, Filipinas -	12 0	5½		Jekatarina Ida., Lapland	6 23	10	
Inagua, Bahamas -	8 0	3½	2½	Jerba, Mediterranean -	3 10	7	5
				Jericoacoara, Brazil -	11 30	12	9
				Jersey (St. Helier), English Channel.	6 29	31½	23

* In March and April.

† See Note, page 175.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Jersey (Rosel) -	6 15	30	21½	Kalang Bayang Harbour, Java.		2	
Jervis Bay, Australia, E. Coast.	6 20	6-9		Kalgalaksha, White Sea	6 50	7	
Jezírat Arabí, Persian G.	6 30?			Kalian Point, Banka Strait	8 17*	12½	
—— Hamar-al-nafur,	9 30	10		Kame-ura, Japan Sea -	7 45	9	
—— Arabia, S.E. Coast.				Kandalaksha, White Sea	3 25	7	
—— Jún Persian Gulf	11 30	10		Kanushin Cape, White Sea	11 54	15	
—— Kabr " -		8½		Kapiti Island, New Zealand	9 0	6	
—— Kais " -	0 45	7½		Karáchi Harb. (entrance)	10 30	9½	6
—— Kharg or Káreg "	8 0	6½		Hindoostan, W. Coast.			
—— Larek " -	10 15			Karakoa Bay, Owyhee -	3 49		
—— Tumb " -		8		Kari or Lukput River, entrance, Hindoostan, W. Coast.	11 15	10½	
Jiddah, Red Sea -		3			12 15	12	
Jijginsk Id., White Sea	5 15	4	10½	Lukput, Hindoostan, W. Coast.			
Joao San, Brazil -	6 24	14			11 15	10½	
Johanna Id., (anchorage)	3 40	11	9	Kotasir, Hindoostan, W. Coast.			
—— Pomony Harb., Comoro Ids.	4 0	11		Kata, Japan Sea -	6 4	6½	
John St., Bay of Fundy -	11 21	27	23	Katwyk, Netherlands -	2 30	5	7
—— Newfoundland - (East Coast).	7 30	6	4	Kawau Id., New Zealand	6 30	10	
—— (North Coast) -	10 40	7½	5½	Kawhia Harb., New Zealand.	9 30	12	
—— River, Africa, S.C.	4 0	5		Keats Port, Australia, N. Coast.	6 0	22	
—— River, U. S. -	7 28	5½	5	Kediwári R., Hindoostan	9 57	7	
Jones Harb., Newfoundland.	7 49	3½	2	Keelacarry, Ceylon -	11 0		
Jonquiere Bay, Gulf of Tartary.	10 0	6		Kedgerree, Bay of Bengal	11 30		
Joombas R., Africa, W.C.	8 10	6		Keeling Islands (Port Refuge), Indian Ocean.	5 30	5	
Josef, San, Port, Patagonia, E. Coast.	10 0	30	25	Kegashka B., G. St. Lawrence.	10 45	5	3
Jourimain Island, New Brunswick.	9 30	6	3	Kelung Harb. (Formosa), China Sea, E. Coast.	10 30	3	
Juande Nova, Madagascar		5		Kenmare R. (W. Cove), Ireland.	3 52	10	7½
Juan Fernandez I., Chile	9 30	4		Kenn Reef, Australia, E. Coast.	8 0	5½	
Juan San, Porto Rico -	8 2	1½		Kennebec River (Hanniwells Point), U.S.	11 15	9½	7
—— San Port, Peru -	5 10	3		Kent Island, Bass Strait	11 10		
Juby Cape, Africa -		8		Kentish Knock, England	11 47		
Judith Point, United States	7 32	3½	3½	Keppel B., Australia, E.C.	9 30	9-14	
Juggee, Seer R., Hindoostan, W. Coast.	1 30	6		Keret, White Sea -	3 8	6	
Jukan Ids., Lapland -	9 0	13		—— Point, White Sea	4 30	5½	
Julian, San, Port, Patagonia, E. Coast.	10 45	30		Kerguelen Island, Indian Ocean.	2 0	2	
Julianshaab, Greenland -	5 6	7	5	Kesm, Persian Gulf -	11 0	12	
Julien, St., Harbour, {	7 21 A.M.	4½	3	Kettle Cove, United States	7 48	5	4½
Newfoundland. {	6 30 P.M.			Khór Jerámeh, Arabia, S.E. Coast.	9 30	10	
Junk Fleet entrance, Canton River, China.	11 50	6½		Kijouk Phyou Harbour, Bay of Bengal.	10 0	9	6
Junk River, Africa, W. C.	5 45	5		Kilbaha, Ireland -	4 16	13	9½
Junkseylon Id. (E. Side), Malacca Strait.	10 0	11½		Kilda, St., Hebrides -	5 30		
Jura Island, (Small Isles), Scotland.	5 3	3½	2½	Kildin Id., Lapland -	6 45	12	
—— Feolin Ferry " -	4 41	6½	4½	Kilkieran Cove, Ireland -	4 34	15½	11
Juria, Hindoostan, W.C.	2 0	16	13	Killala Bay, Ireland -	5 22	10½	8
Kaikora Penin, New Zealand.	5 30	8	6				
Kaipara Harb. (entrance), New Zealand.	10 55	10	8				

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Killeany Bay, Arran Ida., Ireland.	4 28	13½	10	Kuriyán Mariyán Bay and Islands, Arabia, S.E. Coast.	8 20	6½	
Killingholme (Humber R.), England.	6 2	19½	15½	Kurrachee, <i>see</i> Karáchi.			
Killybegs, Ireland -	5 16	11½	8½	Kutch, Gulf of, (mouth), Hindoostan.	11 30		
Killyleagh, Ireland -	12 40	11	9½	Kweshan Ids., China, E. Coast.	9 30	14	
Kilmichael Point, Ireland	8 30	4½	3	Kyau-chau Bay, Yellow Sea.	5 0	12	9
Kilrush, Ireland -	4 42	14	10½	Kyem River, White Sea	5 23	4	
Kincardine, Firth of Forth, Scotland.	2 53	17½	15	Kykduin, Netherlands -	7 0	12	
King Id., Bass Strait -	1 0			Kyle Akin, Loch Alsh, Scotland.	6 16	15½	11
King Port, Falkland Ids.	7 30	5		Kyle Rhea, Scotland -	6 0	15	11
—— Sound, Australia, W. Coast.	0 10	33		Kyuquot Sound, Vancouver Id.	12 0	12	
—— George Sound, Australia, S. Coast.	11 56	1-4		La Poile Bay, Newfoundland.	9 0	6	4
Kings Cove, Newfoundland.	7 15	3½	2½	Labuan Island, Victoria Harbour, Borneo.	9 45	6	
Kingsbridge, England -	5 46	10		Labyrinth Ids., Magellan Strait.	0 30	5½	
Kingstown, Ireland -	11 10	11	8¾	Lacul Harb., St. Domingo	6 0?	3?	
Kinsale, Ireland -	4 43	11½	9	Lady Bay, Australia, S.C.		4	
Kinsiang Point, China, E. Coast.	7 0			Lady Elliot Islet, Australia, E. Coast.	9 0	7-8	
Kircubbin, Ireland -	12 42	11½	9½	Lagos, Portugal -	2 7	13	
Kirindi, Ceylon -	3 30			—— River (Bar), Bight of Benin.	6 0	3	
Kirkcudbright, Scotland	11 10	23		Lagos River (Consulate Wharf.)		2	
Kirkwall, Orkneys -	10 9	10	7½	—— (Palaver Ids.)		1	
Kishm, <i>see</i> Kesm.				Laguimanoc Port, Luzon	1 30	5½	
Kiswara Harb., Africa, E. Coast.	4 30	12		Laguna de Terminos, G. of Mexico.	noon.	1½	
Kitnapatnam, Bay of Bengal, W. Coast.	11 0	1½		Lakadivh Group, Hindoostan, W. Coast.	10 30	6	4½
Kiu-kiang, China, W. C.		24		Lamalin, Newfoundland	9 15	8½	
Klaskino Inlet -	12 0	12		Lambayeque Rd., Peru -	4 0	3	
Klaskish Inlet, Vancouver Id.	12 0	12		Lamlash, Scotland -	11 49	10	7
Knox Bay, Vancouver Id.	12 0	16		Lamo Harb., Africa, E. Coast.	4 6	11	
Knysna Harb., Africa, S. Coast.	3 30	6½		Lancaster, England -	11 16	8½	
Koelwatte Bay, Moluccas		7		Landshipping, Cleddau River, Wales.	6 27	20	14½
Koepang, Timor -	11 0	9	6½	Langshan Crossing, Yangtse-Kiang.*	1 40	12	8
Kokohn, New Zealand -	10 15	10	7	Lankeet Island, Canton River, China.	11 20	6½	
Ko-kun-to Group, Korea, W. Coast.	2 25	18	10	Lansew Bay, China, E.C.	10 0	13	
Kok-si-kon Prt. (Formosa) China Sea, E. Coast.	11 30	3		Lanzarote, Canary Ids. -	1 0?	9?	
Koombanah B., Australia, W. Coast.	9 0	½-3		Laredo B, Magellan Strt.	11 30	9	
Kouloi River -	1 15	20		Largs, Scotland -	11 50	10	
Kou Zomen, White Sea -	3 30	6		Latham Id., Africa, E. Cst.	4 0	10	
Kovda Bay, White Sea -	3 25	6		Latitude Bay, Tierra del Fuego.	2 5	4	
Koweyt, Persian Gulf -	0 15	9		Lau-mu ho, Yellow Sea -	1 30	5	
Kowie River, Africa, S. Coast.	4 0	4-5		Laun, Great and Little, Newfoundland.	8 15	7	4
Krakatoa, Strait of Sunda	7 0	4					
Kúdi River, Hindoostan, W. Coast.	9 50	10					
Kuper Harb., Korea, S.C.	9 28	11½	8½				
—— Port, America, N.W. Coast.	1 40	13	10½				

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Laura Harb., Tierra del Fuego.	1 0	6		Little Egg Harbour, } United States - }	7 10	4½	3½
Lavata Bay, Chile -	9 20	5		Little Fish Bay, Africa, W. Coast.	2 30	5-6?	
Lawrence, Great St., Harb. Newfoundland.	8 30	7	4	Little Gull Island, U. S. -	9 38	3	2½
Le Have Cape, Nova Scotia.	7 48	7	5½	Littlehampton, England	11 36	16	11½
— Nova Scotia, Crooked Channel.	7 51	7½	6	Little Metis, G. St. Law- rence.	2 10	13	8
— Mothers Island	7 51	7	5½	Little Milford Quay, River Cleddau, Wales.	6 31	19	13½
— Getsons Cove	7 55	7½	6	Little Natashquan, G. St. Lawrence.	11 0	5	3
— Bridgewater (McKean's Wharf.)	8 6	8	6½	— Port, Newfound- land.	10 42	5½	
— Lunenburg (Spidlers Cove.)	7 54	7½	6	Little Tancock Island, Nova Scotia.	7 43	7½	6
Le Maire Strait, Tierra del Fuego.	4 0	7		Liverpool, England -	11 23	26	20½
Leervig Fiord, Færøe Ids.	0 30	6½	4½	— Bay, Nova Scotia.	7 50	8	5
Leith, Scotland - -	2 17	16½	12½	— R., Australia -	6 30	12	
Leman Shoal, England, E. Coast.	6 0			Liza Bay, Lapland -	5 58	9	
Lennox Cove, Tierra del Fuega.	4 40	8		Lizard Id., Australia, E.C.	9 15	7-10	
Leopold Port, Barrow Strt.	12 6	6	4½	Lizard Point, (Perran Vose Cove), England.	5 0	14½	10½
Lepreau, Bay of Fundy -	11 18	24½	21	Llanelly (Bar), Wales -	6 16	28	21
Lerwick, Shetland -	10 30	6	4	Lloyd Port, Bonin Ids. -	6 8	3	
L'Etang Harb., Bay of Fundy.	11 19	23½	20	Loanda, San Paul de, Africa, W. Coast.	4 30	5	
Leubu River, Chile -	10 30	5		Loango B., Africa, W.C.	4 30	6½	
Leven Port, Madagascar	3 30	7½		Lobah Point, Banka Strt.*	11 0½	10	
Levrier B., Africa, W.C.	12 0	6-7		Lobito B., Africa, S.W. Coast.	4 15	5-6	
Lewis Cape, St. Labrador	6 30			Lobo Point, Peru -	8 0		
Liant Cape (G. of Siam), China Sea, W. Coast.	5 7	6½		Lobos Cay, Bahamas -	7 40	3	
Liau Ho (Bar), Yellow Sea.	4 0	11½	7½	Lobos Head, Patagonia, W. Coast.	0 29		
— (entrance) -	5 0	12		Loch Aline, Scotland -	5 33	13½	10½
Liau-tung, Chingho, Yellow Sea.	1 20	6½		— Alsh " -	6 16	15½	11
— Gulf (Sand Point), Yellow Sea.	4 50	7	5½	— Boisdale " -	5 47	12½	9½
— N.W. Head of Gulf.	5 30	10	8½	— Broom " -	6 40	14½	10½
Limbe Strait, Moluccas -		5		— Carron " -	6 29	16½	11½
Limerick, Ireland -	6 16	18½	13½	— Cuan " -	5 36	13	9½
Linmonth, England -	6 2	30½	21½	— Duich " -	6 0	15½	11
Lindy River (entrance), Africa, E. Coast.	4 15	12		— Dunvegan, " -	6 7	15½	11
Lingeh, Persian Gulf -	12 0?			— Eil (Head of Loch)	6 27		
Lintin Island, Canton R. China, E. Coast.	12 0	7½		— Eport " -	6 6	12½	9½
Lisbon (Belem), Portugal	2 30	12	9	— Eriboll " -	7 43	14½	11
Liscanor Bay, Ireland -	4 23	13½	10	— Erisort " -	6 43	15½	11½
Liscomb Harb., Nova Scotia.	8 0	6½	4½	— Etive, Stonefield, "	7 3		
Lishan Bay, China, E. C.	10 15	16		— Bunawe " -	7 54	5½	
Lissa, Adriatic -	4 10	2½		— Ewe " -	6 39	14½	10½
List, Denmark -	2 21	6		— Fleet " -	0 22	10½	
Litau Bay, Yellow Sea -	3 0	6	4	— Goil " -	12 6	10	6
Litke Ridge, White Sea -	11 45	15		— Harport -	5 54	13½	10
				— Hourn " -	5 45	13½	10½
				— Inver " -	6 40	14	11
				— Laxford " -	6 44	15	11½
				— Leven (Head of Loch)	6 28		
				— Linnhe " -	5 26	12½	8½
				— Long " -	12 6	12	

* In S.E. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Loch Maddy " -	6 6	12½	9½	Lung-mun Harbour, Yellow Sea.	10 0	7	
— Moidart " -	5 44	13½	9½	Lyme Regis, England -	6 21	11½	8½
— Nevis " -	5 47	14½	10	Lymington, England -	{ 10 25 12 15 }	8	6
— Roag " -	6 11	11	8	Lynn Deep, England -	6 0	23	
— Ryan (Head of Loch)	11 12	11		— Harbour, England		18	
— Skipport " -	5 52	12½	9	— Road " -		20	
— Strivan " -	11 55	6		Lyttelton Port, New Zea- land.	3 50	7½	5½
— Sunart " -	5 40	13½		Mabou River, C. Breton Id.	9 0	4	
— Tarbert, West, Har- ris Island, Scotland.	6 4	11½	8½	Macahé, Brazil - -	2 30	9½	
— — East " "	6 10	13½	10	Macao, China, E. Coast -	10 0	6½	
— — West, Argylc- shire, Scotland.	2 30	1-4		Macassar, Celebes -	4 40	5½	
— — East " "	11 53	9		McDougall Harb., Africa, S.W. Coast.	2 30	5½	
— Tongue " -	7 53	15	12	McLaughlin Bay, N.W. Coast of America.	1 0	14	10
— Torridon " -	6 20	15	11	Maceio, Brazil - -	4 30	8½	
— Tuadh " -	5 29	11½	8	Machias, Seal Id., Bay of Fundy.	11 5	18	14½
Lofoten Ids., Norway -	12 0	9	7½	Macowa, Red Sea -	0 30	2	
Loheia, Red Sea -	1 30	3		Macquarie Harbour, Tasmania.	7 30	3	
Loire R. (St. Nazaire), France.	3 40	15½	11	— Port, Aus- tralia, E. Coast.	8 56	4-5	
Lomas Point, Peru -	8 19	5		Macquereau P., G. St. Lawrence.	2 0	5	3
Lombok, (Ampanamb.), Java Sea.	8 0	6		Madame Id., Madagascar	4 0	5	
London Bridge, England	2 7	20½	17	Madoc Port, Wales -	7 30	17	
— Docks, England	1 57	20½	17½	Madras Road, Coroman- del Coast.	7 34	3½	
Londonderry, Ireland -	8 1	7½	5½	Magadoxa, Africa, E. Cst.	4 30	8	
Looe (East), England -	5 26	16	13	Magdalen Ids., G. St. Lawrence.	8 20	3	2
Lookout Point, United S.	0 58	2	1½	— River, R. St. Lawrence.	11 0		
Lopez Cape, Africa -	4 30	4-6?		Magdalena Sta., Island, Magellan Strait.	12 0	10	
L'Orient (Port Louis), France.	3 11	13	9½	Magdalene B., California	7 35	6½	
Lord Howe Island, S. Pacific.	8 30	6		Mahato Id., Africa, E.C.	4 30	7	
Lorenzo, St., Channel, Mexico, W. Coast.	8 30	6		Mahneah R., Africa, W.C.	7 40	11	
Lo-shan-kau, Yellow Sea	4 30	11	9	Mahone Bay, Nova Scotia	8 0	7	
Lough Larne, Ireland -	10 48	6½	6½	— Heckmans Anchorage.	7 45	7½	6
— Rossmore, Ireland	5 20	11	8	— Princes Inlet	7 42	7½	6
Louis Port, France -	3 11	13	9½	— Ham Island	7 47	7½	6
— Mauritius -	12 30	3	2½	— Martins R. -	7 43	7½	6½
Louis, St., Bay, St. Do- mingo.	irr.	2-3?		— Chester -	7 44	7	5½
Louisburg Harb., Cape Breton Id.	8 0	5	4	Mahons R., United States	9 52	7	5½
Low Bay, Falkland Ids.	5 0	5½		Maiden Rocks, Ireland, N.E. Coast.	10 43	6½	6½
— Port, Patagonia, W. Coast.	0 40	7		Majambo B., Madagascar	4 30	16	
Lowestoft, England -	9 57	6½	5½	Makátein, Arabia, S.E. Coast.	9 0	6	
Luabo River (entrance), Africa, E. Coast.		22		Makalleh, Arabia, S.E. Coast.	8 30	7	
Lucas San, Bay, California	9 20	9½		Makongai Id., Fijii Ids. -	6 0	4	3
Lucipara Pass, Banka Strait.	irr.	10	7½	Makumba R., Madagascar	4 45	17	
Luis, St., Texas, G. of Mexico.		1½	¾				
Luis Obispo, San, California	10 8	4½	3½				
Lnnaire Bay, Newfound- land.	7 0?	2-3?					
Lundy Island, England -	5 15	27	20				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Makung Harb., Pescadres, China Sea.	10 30	9½	7	Margarets, Newfoundland	9 28	4½-6½	
Malabrigo Port, Peru -	5 0	2		Margate, England -	11 40	15½	13
Malacca Strait (light ves- sel, one fathom bank).	6 0	15	12	Maria Cape, Saghalin Id., Sea of Okhotsk.	2 0	5	
—— (off Mount	8 0	11	8½	Maria Sta., Id., Chile -	10 20	6	
Formosa).				Maria Van Diemen Cape, New Zealand.	8 0	7	
—— Road, Malacca St.	7 30	11	8½	Marion Bay, Australia, S. Coast.	2 6	4	
Malaga, Spain -	12 0	3		Maristow, River Tavy, England.	5 47	8½	4½
Malahide Inlet, Ireland -	11 15	10	8	Marjoribanks Harbour, Korea, W. C.	3 30	29	
Malcolm Atoll, Maldives	10 30	3		Mark, St., Bay of, St. Domingo.	8 0?	1?	
Maldon, Chelmer River, England.	12 32	10	6	Marka or Muerka, Africa, E. Coast.	4 30	8	
Malè, Maldives -	12 30	3		Marks, St., United States	1 14	3	2½
Malludu Bay, Borneo -	10 30	6-8		Maroni Bay, Comoro Ids.	4 53	10	
Malo, St., France -	6 5	35	26	—— River, Guayana	5 30	8	6
Malpelo Point, Peru -	4 0	10		Martaban, Bay of Bengal	2 20	21	
Man-of-War Cay, Baha- mas.	8 10	4		Martin, St., Cove, Tierra del Fuego.	3 30		
Mana Island, New Zealand	7 0	8	6	—— C. Horn	3 50	8	
Manama, Persian Gulf -	5 20	7		Ids., Tierra del Fuego.			
Manawatu River, New Zealand.	10 0	8	6	Martin, St., de la Arena, Spain, N. Coast.	3 30	15	
Mancenilla Bay, St. Do- mingo.	7 0	4-5		Martin Vas Rocks, South Atlantic.	3 45		
Mandwa Creek, Hindoo- stan, W. Coast.	10 45	7	5	Martinique, Robert Harb. Carribean Sea.		4-5	
Mangalore, Hindoostan, W. Coast.	11 0	7	5½	Mary, Cape St., New- foundland.	8 30	7	5
Manganitoe Bay, Moluc- cas.	5 0			Mary St. Harb., Mada- gascar, E. Coast.	4 0	5	
Mangarol Bunder, Hin- doostan, W. Coast.	10 30	7	5	—— Newfoundland -	7 40	7½	5
Manicouagon River, R. St. Lawrence.	2 15	12	7	Mary Port St., I. of Man	11 10	20	16
Manila (Luzon Island), China Sea, E. Coast.	10 40	5-7		—— St., Scilly Is. -	4 18	15½	11½
Manna, Navigators Ids. -		6		Maryport, England -	11 3	18	13
Manning River, Aus- tralia, E. Coast.	9 15	4		Mascot, Persian Gulf -	11 15	6	
Manorah R., Hindoostan, W. Coast.	1 30	16		Mason B., New Zealand	11 10	8	6
Manta Port, Ecuador -	3 4	6		Massacre Bay (Tasman corner), New Zealand.	8 45	13	9
Manukau Har. (entrance), New Zealand.	9 30	13	10	Massacre Bay, Motu Pipi River, New Zealand.	9 50	14	10
Manybranch Harb., Falk- land Ids.	7 40	7½		Massowah, Red Sea -	1 0	3	
Maple Bay, Vancouver Id.		12		Matacumbe Bay, Lower United States.	8 23	2½	1½
Maplin Light (Thames), England.	12 5	14½	10½	Matan River, G. St. Lawrence.	2 15	11	7
Maquereau Point, G. of St. Lawrence.	2 0	5	3	Matuku, Fijii Ids. -	6 18	5	3
Maranham, Brazil -	7 0	16½	10½	Maule River, Chile -	10 0	5?	
Marblehead, United States	11 30	12		Maulmain, Bay of Bengal,	2 0	22	17
March Harb., Tierra del Fuego.	3 10	6		Mauritius (Port Louis) -	12 30	3	2½
Marconf, St., France -	9 55	20		—— (Grand Port) -	1 0	1½	
Mare Harb., Falkland Ids.	6 0	6		May Cape, United States	8 19	6	5
Margarets, St., Bay (Shut-in Island) Nova Scotia.	7 47	7½	6	Mayday Bay, Palawan -	9 55	3½	
				Mayhé Id., Indian Ocean	4 0	6½	
				Mayotta Id., Mozambique	4 10	11½	
				Mayumba, Africa, S.W.C.	4 35	7	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Mazambo Port, Madagascar.	4 30	15		Millport, Cumbrae Island, Scotland.	11 50	10	6
Mazatlan, Mexico, W. Cst.	9 40	7		Min R. (Temple Point), China, E. Coast.	10 45	19	14½
Mbau Roads, Fijii Ids. -	5 46	6		Min R. (Losing Island), China, E. Coast.	12 0		
Mboli Harbour, Florida Id., Solomon Ids.	5 30	6		Mindanao, S. Point Filipinas.	7 0	6	
Meichen Sound, China, E. C.	12 30	17		Minehead, England -	6 24	32½	24½
Melbourne, Australia, S. C.	2 48			Mingan Harbour, Gulf St. Lawrence.	1 16	6	4
Melinda P., Africa, E. C.	4 15	11		Mingan Id., G. St. Lawrence	1 30	6	4
Mellacores R., Africa, W. Coast.	7 40	11		Minimegash, Prince Edward Island.	3 30	5	3
Mellish Reef (Sand Cay), Australia, E. Coast.	7 55	5-6		Minow Islands, Madagascar, W. Coast.	5 0	15	
Mellon, Ireland -	6 1	18½	19½	Minquiers Rocks, France	6 6	35	26
Melo Port, Patagonia, E. C.	3 40	15		Miramichi (Bar), Gulf St. Lawrence.	5 30	5	3
Memory Rock, Bahamas.	7 50	3		Mira-por-vos, Bahamas -	9 30	3	2½
Menadou B., C. Breton Id.	8 15	5½		Mirs Bay (Tide Cove), China, E. Coast.	10 0	6½	
Menam River, (Paknam), China Sea, W. Coast.	5 7	9½		Miscou, G. of St. Lawrence.	2 30	5	3
Menemsha Bight, U.S. -	7 45	4	2½	Mississippi, S. W. Pass, Gulf of Mexico.		1½	
Mensular Id., S.E. end, Sumatra.	6 0	4		Mistanoque, Labrador -	10 30	6	3
Merbát, Arabia, S.E. Cst.	9 0	6½		Mistley Quay, Stour R., England.	0 48	11½	
Mercy Bay, Banks Land		2		Moala, Fijii Islands -	5 50	5	
Mercury Bay, New Zealand.	7 21	7	5	Mobile, Gulf of Mexico	irr.	1-2	
Mergui, Bay of Bengal, E. Coast.	10 30	18		Mocha Island, Chile -	10 30		
Merigomish, Nova Scotia	10 6	5½	3½	Mocha Road, Red Sea, (E. Coast).	12 0	4½	
Merville, France -	9 36	21	17½	Mogador, Africa, W. Cst.	1 18	10-12	
Metway Port, Nova Scotia	7 50	8	5	Molynaux Bay, New Zealand.	3 0	8	6
Mevagizey, England -	5 4	15½	12	Mombaza Port, Africa, E. Coast.	4 0	11	
Mexillones Port, Bolivia	10 32	3		Monach Ids., Scotland, W. Coast,	5 44	12½	8½
Mezen, White Sea -	1 48	15-22		Monckton (Railway), Bay of Fundy.	0 15	47	37½
M'hul Dwarka, Hindoostan, W. Coast.	10 30	7		Mondego (Bar), Portugal	2 30	7	
Miau-tau, (Depôt Bay), Yellow Sea.	10 35	6		Monganui Harb., New Zealand.	8 15	9	7
Miaveness, Faeroe Islands	3 12	6½	4½	Monomoy, United States	11 30	5½	4
Michael, St., Azores -	12 30	6		Monrovia, Africa, W. C.	6 0	6	
Michael Seymour Port, Gulf of Tartary.	5 30	3		Montauk Pt., United States.	8 20	2½	2
Middle Cove, Tierra del Fuego.	3 30			Monterey, California -	10 22	4½	3½
Middle Id., Patagonia, W. C.	12 0			Montgomery Isles, Australia, W. Coast.	12 0	36	
Middlesbrough, R. Tees, England.	3 55	13	10½	Montrose, Scotland -	1 25	13	10
Middleton R., Bight of Benin.	4 15	5		Monts, Point de, Gulf St. Lawrence.	12 0	12	6
——— Reef, South Pacific.	8 30	6		Moreno (Constitucion Road), Peru.	10 0	4	
Midway Island, North Pacific.	3 13	3		Moreton Bay, Australia, E. Coast.	9 30	3-7	
Milford Haven (St. Ann Lighthouse), Wales.	5 56	24	18				
Milford Sound, New Zealand, Mid. Island.	9 15	8	6				
Millman Island, Palawan, W. Coast.	10 27	2½					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Morewellham, R. Tamar, England.	6 12	10½	6½	Namki Ids., China, East Coast.	8 30	17	
Morjovets Id., White Sea	11 20	17		Namo Harbour, China	10 0	7½	
Morlaix Road, France -	4 53	24	18	Sea, W. Coast.			
Morro (Sandy Pt.),	5 0	11		Namoa Island (Clipper Road), China, E. Coast.	11 15	7	
Ecuador.				Namquan Harb., China,	10 0	17	
Mossel B., Africa, S. Cst.	3 30	6		E. Coast.			
Moudiuga Id., White Sea	5 50	3½		Namu Harbour, N.W.	1 0	15	12½
Mount Desert Island,	11 10	13		Coast of America.			
United States.				Nanaimo Harb., Gulf of	5 0	14	
— Louis Bay, R. St.	11 0	6-8	4	Georgia, Vancouver Id.			
Lawrence.				Nancowry Harb., Nicobar	9 15	8½	
Mourondava, Madagascar,	4 45	12		Islands.			
W. Coast.				Nandi Passage and Bay,	6 35	4½	
Mouton Port, Nova Scotia	7 54	7½	5½	S. Pacific.			
Moville, Ireland -	7 6	7½	5½	Nangamessie Harbour,	11 30	17	13½
Mowah Bunder, Hindoo-	1 0	12	9½	Sumba.			
stan, W. Coast.				Nangka Id., Banka Strait		12	
Mozambique Har., Africa,	4 15	12		Nanoose Harbour, Van-	5 0	15	
E. Coast.				couver Id.			
Mucaras Reef, Bahamas	7 40	3		Nantucket, United States	12 24	3½	3
Muerka, <i>see</i> Marka.				Napoleon Road, Gulf of	2 30	2½	
Mugeris Harb., Bay of	9 30	1½		Tartary.			
Honduras.				Narrinda Bay, Mada-	4 30	15	
Mull of Cantyre, Scotland	10 35	4		gascar, W. Coast.			
Mulroy Bay (Bar), Ireland	5 40	11½	8	Narrows (First), Magellan	9 0	36-42	
Mumbles Ltight House,	6 1	27½	20½	Strait.			
Wales.				— (Second), Ma-	10 0	23	
Mungalaum Id., China	11 0	5		gellan Strait.			
Sea, E. Coast.				Naruto (Fukura) Japan	6 17	7	
Mungullo or Mongallo R.,	4 45	12		Sea.			
Africa, E. Coast.				Nash Point, Bristol	6 25	33	25
Murdounah Id. (E. Cst.),	6 0	3		Channel.			
Red Sea.				Nasparte Inlet, Vancou-	12 0	12	
Murray Islands, Torres	9 30	10		ver Id.			
Strait.				Nassau, New Providence,	7 30	4	3
Murray Pass, Bass Strait	11 10	8		Bahamas.			
Musa Port, Babuyan Ids.		5		Nassau Bay, Tierra del	4 0	6	
Mutlah River, (entrance	10 0	14		Fuego.			
to Biddah River), Bay				Natal Port, Africa, S. C.	4 30	6	
of Bengal, W. Coast.				Naturaliste Channel,	11 45	6	
Mutlah (Muda Kali),	11 45	15		Sharks Bay, Australia,			
Bay of Bengal, West				N.W. Coast.			
Coast.				Navallo Port, France -	3 42	13	9½
Mutton Island, Ireland,	4 20	13½	9½	Nazaire, St., France -	3 40	15½	11
W. Coast.				Naze, The, England -	12 6	12½	10
Myggenses Fiord, Færoe	9 0	9½	7½	Nee-ah Harbour, Oregon	12 33	7½	6½
Islands.				Needles Point, England -	9 46	7½	5
Na Vatu Reef, S. Pacific	6 8	4		Negapatam, B. of Bengal	5 0	3	
Naafe R., Bay of Bengal,	10 0			Negro Harbour, Nova	8 12	7	5½
E. Coast.				Scotia.			
Naalsole Fiord, Færoe	4 0	6½	4½	Negro River, Patagonia	11 0	14	
Islands.				Nelson, New Zealand -	9 50	14	10
Nafa-Kiang, Loo Choo	6 28	7		— Port, Australia,	12 0	27	
Islands.				N.W. Coast.			
Nagasaki Bay, Japan	7 15	9	7½	Nempkish River, Van-	0 30	14	
Sea.				couver Island.			
Nagore, Bay of Bengal,	8 15			Nerbudda River (Broach	3 40	25	
W. Coast.				Point, Hindoostan, W.			
Nairai Id., Fijii Ids. -	5 53	4½	3½	Coast.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Neuf Port, Gulf St. Lawrence.	2 10	13	8	Ning-hai, Yellow Sea -	12 0	6	
——, River St. Lawrence.	8 30	14	9	Nin-po-fu, Yung River, China E. Coast.	1 0	9	
Neville Port, Vancouver Id.	0 30	17		Nisqually, America, N.W. Coast.	6 0	18	15
New Bedford (entrance), United States.	7 57	4½	4	Noamh Island, Scotland	5 2	11½	7
—— Castle, United States	11 53	7	6½	Noel Bay, Bay of Fundy	12 41	50½	43½
—— Haven, United States	11 16	6½	5½	Noir Island, Tierra del Fuego.	2 30	5	
—— London, United States.	9 28	3	2½	Noirmontier, France -	3 2	16	11½
—— Providence, S. W Bay, Bahamas.	7 30	4		Nolloth Port, Africa, S.W. Coast.	2 30	5½	
—— Perlican Harbour, Newfoundland.	7 30	4	2½	Nootka Sound, Vancouver, Id.	12 0	12	
—— Rochelle, U. States	11 22	8½	7½	Norderney, Germany -	10 30	8	
—— R., New Zealand -	12 10	8	6	Nore, England -	12 30	15½	13
—— Ross, Ireland -	6 4	12½	10	Norfolk Island, S. Pacific	7 45	7	
—— Year Sound, Tierra del Fuego.	8 30			North Balabac Strait, China, E. Coast.	10 50	5	
—— York, United States	8 13	5½	4½	North Cape, C. Breton Id.	8 0	4	
Newburyport, United States	11 22	9	7½	—— Edisto River, United States.	7 10	7	5½
Newcastle, Australia, E. Coast.	9 0	3½-5		North Harbour, Newfoundland.	8 0	7½	5
—— England -	4 23	10½		—— Sands, Malacca Strait.	5 30	15	12
—— Ireland -	11 4	14½	12	Nosari Khari (Bar), Hindoostan, W. Coast.	3 0	18	
Newhaven, England -	11 51	20	15	Noss Island, Madagascar	5 0	15	
Newport, United States -	7 45	4½	4	Nova Zembla Harbour, Lapland.	6 36	10	
—— Wales, (South Coast.)	7 10	39	29	Nowanugga, Hindoostan, W. Coast.	1 45	18	14
—— (W. C.)	7 0	12	9	Nuchatlitz Inlet, Vancouver Id.	12 0	12	
New Quay, Wales -	7 30	15		Nuevo Gulf, Patagonia, E. Coast.	7 0	10	
Newton Stewart, Scotland, W. Coast.*	12 0	12	6	—— Port, Central America.	3 10	12	
Ngaloa, Fijii Islands -	6 0	5		Nukulau Port, Fijii Ids.	6 47	5½	
Nhatrang Bay, China, W. Coast.	8 30	5½		Numa-choa, Comoro Ids.	3 0	14	
Nicholas, St., Harb., G. St. Lawrence.	1 55	12	7	Numea Bay, New Caledonia.	8 25	4	
—— Port, Peru	5 15	3		Nunez River, Africa -	10 0	15	11½
Nicholson Port (Lambton Harbour) New Zealand.	4 30	5	3	Nyminde Gab, Jutland -	2 41	2	
Nicobar Id. (Nancowry Harb.), Indian Ocean.	9 15	8½		Nysna or Knysna Harb., Africa, S. Coast.	3 30	6-7	
Nicolas, St., Bay, Magellan Strait.	2 6			Oban, Scotland -	5 22	12	9½
Nicoya Gulf (Port Heradura), Cent. America.	3 9	10		Obb of Harris, Isle of Harris, Scotland.	6 16	11½	8½
Nieuport, Belgium -	12 18	16	13	Observatory Id., China Sea, E. Coast.	11 0	5½	
Nieuwediep, Netherlands	7 27	4	3½	Ocracocke Inlet, United States.	7 4	2½	2
Niger River (Nan entrance), Africa, W. Coast.	4 8	6		Octavia Bay, New Granada.	3 30	13	
Nikolskoi Chan., White Sea.	5 25	3		Oelar Cape, Banka Strait	6 30	12	
—— Twr., White Sea	6 0	2		Oho Sima, Loo Choo Ids.	7 30	5½	
Nimrod Sound, China, E. Coast.	10 30	20		Oibo Harb., Africa, E.C.	4 15	6	
Ninepin Group, China E. Coast.	10 0	5		Okarito Lagoon, New Zealand.	11 40	9	

* At Carty Quay.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Olaveaga, Bilbao River, Spain.	3 15	12		Ounalashka Id., America, N.W. Coast.	7 30	7½	
Old Pt., Comfort, United States.	8 17	3	2½	Ouro R., Africa, W. Cst.	12 0	8-9	
Old Providence, Bay of Honduras.	irr.	1		Ower Shoal, England, East Coast.	6 30		
Olenji Islands, Lapland -	7 30	12		Oxbaasheia, Svec Fiord, Norway.	12 0	8	
Oleron, Ile d', France -	3 50	19		Oyster Bay, United States	11 7	9½	8
Olga Bay, G. of Tartary	5 30	3		Oystreham, France -	9 38	21	16
Omaider Island (Gulf of Akabah), Red Sea.	6 0	4		Packsaddle Bay, Tierra del Fuego.	3 30	6	
Omersari R., Hindoostan, W. Coast.	1 45	18		Padstow, England -	5 13	20½	16½
Omonville, France -	7 29	15½	12½	Pagham (entrance), England.	11 30	16½	12½
'Om-rasas-Masirah, Arabia, S.E. Coast.	10 0	10		Pago Pago, Navigators Ids., S. Pacific.			4½
One Fathom Bank Light, Malacca Strait.	6 0	15	12	Paimpol, France - -	6 0	31	23½
Onega River, White Sea	9 17	6-7		Palais, Port le, Belle Ile, France.	3 18	14½	10½
Ono Ids., Fijii Ids. -	6 0	4		Palliser Cape, New Zealand	6 0	6	
Ooloogan Bay, China Sea, E. Coast.	9 30	5½		Palm Isles, Australia, E.C.		8-10	
Oonting Port, Ioo Choo Islands.	6 35	8		Palma, Canary Ids. -	12 30?	9?	
Oösaka R. (entr), Japan	7 30	5½	4½	Palmas Cape, Africa, W.C.	4 30	4	
—— City " "	8 17	2½	½	Palmedo Road, Sumba Id.		15	
Oösima, Japan Sea -	6 50	5		Palmeira Point, Ceylon -	9 30	7-11	
Oösuka, Japan Sea -	9 16	8½	1½?	Paluan Bay, Mindoro -		5	
Oparo Harbour, S. Pacific	12 23	2½		Pamarung Ids., Borneo, E. Coast.		8-10	
Oporto, Portugal - -	2 30	10		Pampang Bay, Java -		7-8	
Orange B., T. del Fuego	3 30	5		Panama Road, Central America.	3 23	15-22	10-16
——Cape, Magellan Strt.	3 0			Pancol, China Sea, E.C.	9 40	6	
Orete, see New River.				Pansand Hole, England -	12 0	15½	13
Orford Haven (Bar), England.	11 30	7½		Paposo, Chile - -	9 40	5	
—— Port, California -	11 26	6½	4½	Paquique Cape, Bolivia -	9 45		
—— Quay, England -	12 30	7½		Para, Brazil, N. Coast -	12 0	11	
Orfordness, England -	11 15	8	6½	Parahiba, Brazil -	5 0	9-12	
Orinoco River (entr.) Guayana.	6 0	3		Parenga-renga Harbour, New Zealand.	7 54	7	
Orleans Id., R. St. Lawrence.	5 40	17	13	Parida Id., New Granada	3 15	10½	
Ormond, Kenmare River, Ireland.	3 43	10	7½	Parsboro, Bay of Fundy	12 17	43	37½
Ornsay, I. of Skye -	5 50	14½	10½	Pasado Cape, Ecuador -	3 30	10	
Orlov Letni C., White S.	5 18	4		Pasages Port, Spain -	3 0	12	9
Os Ilheos, Brazil -	4 30			Passage or Culebra P., Caribbean Sea.	9 0	1	
Osaki, Japan Sea -	5 55	6½		—— Id., Banda Sea -	noon	6	
Oscuro Cove, Patagonia, W. Coast.	0 55	20		Passandava Bay, Madagascar, W. Coast.	5 0	15	
Osprey Reef, Australia, E. Coast.	8 36	6		Patapsco R. (Bodkin Pt.) United States.	5 42	1½	1
Ostend, Belgium -	12 25	19	15	Paterson Port, Australia, N. Coast.	4 0	16-24	
Otago Har., New Zealand	2 50	7	5	Patersons Inlet, New Zealand.	1 10	5	6
Otaheite, South Pacific -	noon	1½		Patrick Port, Scotland -	11 10	15	12
Otterswick, Orkneys -	9 13	11	8	Patta B., Africa, E. Cst.	4 30	10	
Otway Port Patagonia, W. Coast.	11 37	6		Patteson Port, Vanu Lava Id., Banks Ids.	6 40	5	
On ou Kinsh Inlet, Vancouver Id.	12 0	12		Patuxent R., U. States -	1 16	2	1½
				Patytan Bay, Java -	3 0	7	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Paul de Loanda, San, Africa, S.W. Coast.	4 30	5		Peros Banhos, Indian Ocean.	1 30	5	
Paul St. Id., Indian Ocean	11 0	3		Perouse, La, Strait, Japan Sea.	10 30	6	
— G. St. Lawrence	8 0	5	3	Perron Cape, Sharks Bay, Australia, N.W. Coast.	12 45	5½	
Paumben Pass, Bay of Bengal, W. Coast.	1 30	2		Perth, Scotland	3 35		
Payta Port, Peru	3 20	3		Perula B., Mexico, W.C.		7	
Pearce Point, Australia, N. Coast.	6 55	20	26	Pescadore Ids. (Makung Harb.), China Sea.	10 30	9½	7
Peckett Har., Magln. Strt.	12 0	6		Peter, St., Bay, C. Breton Island.	7 30	6	4
Pedro Gonzales, New Granada, (Trapichi Id.)	3 50	16		— Harb., Prince Edward Island.	8 30	4	2½
Pedro, San, Pass, Patagonia, W. Coast.	0 30	9		Peterhead, Scotland	0 34	10½	8½
— San, Anchorage, California.	9 45	4¾	3½	Petit Passage, B. of Fundy	10 41	22	18
Peejow, see Pidioe.				Petit Port, B. of Islands, Newfoundland.	10 42	5½	
Peel, Isle of Man	11 8	16½	13	Petrel Bay, St. Francis Isle, Australia, S. Coast.	12 0	6	
Pegasus Port, New Zealand	11 50	8	6	Petucura Rock, Patagonia, W. Coast.	0 50	16	
Peh-tang-ho, Yellow Sea	3 33	10	7½	Pheasant Point, Wusung River, China, E. C.	0 35	18	8
Pei-ho or Peking River (entrance), Yellow Sea.*	3 40	10	7½	Philadelphia, U. States	1 18	6¾	5½
— (Tien-tsin)	7 0	4½		Philip B., E. side, Magellan Strait.	9 30	24	
Pelew Islands, N. Pacific		6		Philip Port, Australia, S. Coast.	9 42	7	5½
Pelican Lagoon, Kangaroo Id., Australia.	5 0	6		— Queens Cliff	10 50	3	2
Pelorus Sound, New Zealand.	9 35	11	7	— Nepean Point	10 53	2¾	1½
Pemba Channel, Mozambique.	4 0	11		— Dromana	2 19	3	2½
— Id., Mozambique	4 15	12		— Schnapper Pt.	2 14	2¾	2
Pembroke Dockyard, Wales.	6 12	21	15½	— Bellarine Jetty	2 21	2½	2
Penang, Malacca Strait	12 0	9	7½	— Harvey Point	2 39	3	2½
Peñas Cape, Tierra del Fuego.	6 2	12		— Geelong	2 30	3½	2½
Pender Harb., Strait of Georgia, B. Columbia.†	6 0	13		— Williamstown	2 31	2¾	2
Peniche, Portugal	1 54			— Melbourne	2 48		
Penmark Rocks, France	3 16			Piankatank R. (Cherry Point), United States.	10 5	2	¾
Pennington R., Bight of Benin.	4 15	5		Pichidanque Bay, Chile	9 20	5	
Pensacola, G. of Mexico		1½		Pictou Har., Nova Scotia	10 0	6	4
Pentillie, R. Tamar, England.	5 55	13½	9½	Pidioe or Peejow Bay, Lombok.		10-12	
Pentland Firth, Stroma, S. Side.	9 47	7½	6	Piel Harbour, England	11 5	28	21
— Swona, E. Side	10 24			Pierre, St., Newfoundland	8 33	6½	4½
— W. Side	9 35			— Island, China Sea, E. Coast.		4	
— Great Skerry, E. Side.	11 4	7¾	6½	Pigeon Bay, Yellow Sea	11 45	8	
— W. Side	10 53			Pihkishan Ids., China, E. Coast.	8 30	17	
Penzance, England	4 30	16½	12½	Pillar C., Magellan Strt.	1 0		
Percy Isles, Middle or No. 1 Id.	10 30	16	13	— Cape, Tasmania	1 0	6	
— South or No. 2 Islet, Australia, E. Coast.	10 30	14		Pillars, R. St. Lawrence	5 0	17	10
Perim Id., G. of Aden	12 0	7		Pimlea Harb., Africa, E. Coast.	4 30	12	
Pernambuco, Brazil	4 45	8-6		Pinas Bay, New Granada	3 15	14	
				Pinmill, Orwell River, England.	12 20	12	

* Time and rise much affected by winds.

† From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Pio Quinto Port, Babuyan Islands.	6 0	6		Porthcawl, Wales -	6 8	28½	21½
Pirie Port, Spencer Gulf, Australia, S. Coast.	7 15	9-11		Porth-dyn-lleyn, Wales	8 30	16	
Pisco Bay, Peru -	4 50	4		Portishead, England -	7 13	40	31
Piti Palena, Patagonia, W. Coast.	12 23	10		Portland Inlet (Salmon Cove) America, N.W. Coast.	1 8	16	
Piti River, Hindoostan, W. Coast.	10 5	9		----- United States	11 25	10	7½
Placentia, Newfoundland	9 15	8		----- Bay, Australia, S. Coast.	Midnight.	4	
Plank Point, Spencer Gulf, Australia, S. Cst.	6 15	6-8		----- Breakwater, England.	7 1	6½	4½
Playa de Incia, Cuba -	7 31	2½		Porto Frio, Brazil -	2 40	4½	
Playa Marie Bay, California.	9 20?	7-9?		Porto Praya, St. Jago, C. Verde Ids.	6 0?	5	
Playa Parda Cove, Magellan Strait.	1 8			Portree, Isle of Skye -	6 32	15	10½
Pleasant Port, Falkland Islands.	5 0	6½		Portrieux, France -	6 0	31	23½
Plettenberg Bay, Africa, S. Coast.	3 10	6		Portsbridge (Portsmouth) England.	11 48	6½†	4
Ploughrescan, France -	5 17	25½	18½	Portsmouth Dockyard, England.	11 41	12½	10
Ploumanach, France -	5 15	24½	18½	Portsmouth, United States	11 23	10	8½
Plumper Cove, Howe Sound, G. of Georgia, British Columbia.*	noon.	12		Possession Bay, Magellan Strait.	8 35	42	
----- Sound (Fane Id.), Vancouver Id.	irr.	12		----- Cape, Torres Strait.	9 0	6	
Plymouth Breakwater, England.	5 37	15½	11½	----- Id., Torres St.	1 0	9½	
----- (Sutton Pool)	5 32	15½	11½	Post Office Island (Charles Island), Galapagos.	2 10	6	
----- United States	11 19	11½	10½	Post Office Island, Torres Strait.	1 0	9½	
----- New, New Zealand.	9 30	12	9	Pouinipet Island, Caroline Islands, N. Pacific.	6 0	4½	
Pomba B. Africa, E. Cst.	4 0	15	11	Poulamente B., Madame Id., C. Breton Id. -	7 50	6	4
Pomeroy Inlet, Labrador	6 20	7	4	Poulton-le-Sands, England.	11 26	27½	21½
Pomquet, Nova Scotia -	9 15	4	2½	Poverty Bay, New Zealand	6 5	6	
Ponga River, Africa, W. Coast.	7 30	12	9½	Pratas Shoal, China Sea	4 0	5	
Poolbeg Lt. Hse., Ireland	11 12	12-14	9-11	Preservation Inlet, New Zealand.	11 20	8	6
Poole, England - -	{ 9 10	{ 6½	4½	Preston, England - -	11 49	10	4½
Poolewe, Loch Ewe, Scotland.	{ 12 45	{ 14½	10½	Prince Frederick Harb., Australia, N.W. Cst.	12 0	28	
Pootoo Island, China, E. Coast.	8 15	12		Prince Regent River (St. George Basin), Australia, N.W. Coast.	12 20	24-37	
Poqueldon Harb., Patagonia, W. Coast.	0 54	18		Prince of Wales Strait, Banks Land.		3	
Portaferry, Ireland -	12 0	18-21	12-16	Princes Id., Bight of Biafra	3 45	4½	
Port-au-Choix, Newfoundland.	10 47	5		Princess Royal Harbour, Australia, S. Coast.	11 56	1-4	
Port au Prince, Saint Domingo.	8 0?	1?		Prospect River, Nova Scotia.	7 43	7	6
Port-en-Bessin, France -	8 57	20	15½	Provincetown, U. S. -	11 22	10½	9½
Port Royal, Jamaica -	11 0	1		Pubnico (Beach Point), Bay of Fundy.	9 25	12	10
----- Sound, U.S.:				Puerto Bueno, Patagonia, W. Coast.	1 40		
Entrance - - -	7 16	7½	6½	Puerto de Baitiqueri, Cuba.	9 7	2½	
Beaufort - - -	7 26	3½	2½				
Portchester, England -	11 46	13½	10½				
Portendik, Africa, W. C.	10 0	6					

* From observations made in the month of October.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	10		Radama Port, Madagascar, W. Coast.	4 40	13	
Puerto de Maravi, Cuba	7 56	2½		Ragged Id., Sumbawa, Java Sea.	8 10	3.	
Puerto de Mata, Cuba -	6 49	2½		—— Point, Borneo, E. Coast.		7	
Puerto de la Plata, St. Domingo.	7 30	3?		Raine Id., Torres Strait	8 10	10	
Puerto de Taco, Cuba -	8 49	2½		Rajang River, Borneo -	4 45	13	9
Puget Sound (Nisqually), America, N.W. Coast.	6 0	18	15	Rajapur River (entrance)	11 0	9	7
Pugwash Harbour, Nova Scotia.	10 30	7	4	—— (town)	12 20	7	
Pulaski Fort, United States	7 20	8	7	Hindoostan, W. Coast.			
Pulicat Shoals, Coromandel Coast.	9 25	2½		Rajpuri River (entrance), Hindoostan, W. Coast.	10 40	11	6
Pulo Aor, Sumatra, N.E. Coast.		5		Ramos R., Bight of Benin	4 20	5	
Pulo Condore, China Sea, W. Coast.*	2 30	6½		Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Pulo Leat, Gaspar Strait	2 30	4		Ramsay Sound, Wales -	6 0	17	
Pulo Mendanao, Gaspar Strait.	2 30	4		Ramsey, Isle of Man -	11 12	19½	16
Pulo Panjang, G. of Siam	7 0	2		Ramsgate, England -	11 44	15	12
Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½		Ramso Fiord, Norway -	10 45	7	
Puluqui Id., Patagonia, W. Coast.	1 5			Random Head Harbonr, Newfoundland.	7 8	3½	2½
Puna Island, Ecuador -	6 0	11		Rangoon, Bay of Bengal, E. Coast.	5 30	21	14
Pwlheli, Wales -	7 46	13½	9½	—— R. (entrance), B. of Bengal, E. Coast.	3 15	21	14
Quaco, Bay of Fundy -	11 35	30	25	Raoul or Sunday Island, S. Pacific.	6 0	5	
Quan-chow-wan, Gulf of Tongking.		9-10		Rappahannock (Saunders Wharf), United States.	3 2	2½	2
Quatsino Sound, Vancouver Id.	11 0	11		Rás Hafún, Africa, E.C.	6 15	4	
Quebec, R. St. Lawrence	6 38	18	13	Rás Jerdaffoon. See Guardafui Cape.			
Queda, Malacca Strait -	12 0	5½		Rás Mohommed (Gulf of Akabah), Red Sea.	6 0	5	
Queen Charlotte Sd. (entrance), New Zealand.	8 50	8	6	Rás Sharmah, Arabia, S.E. Coast.	9 0	8	
Queensferry, Firth of Forth, Scotland.	2 37	18	14	Rás-al-Kheimh, Persian Gulf.	11 45	7	
Queenstown, Ireland -	5 1	11½	9	Rás-al-Asidah { Arabia } S.E. Coast	8 30	5½	
Quelan Cove, Patagonia, W. Coast.	0 28			Rás Shébali { S.E. Coast }	10 0	10	
Quentin, Port San, California.	9 5	9		Rás-al-Hed { Coast }	9 30	9	
Quicavi Bluff, Patagonia, W. Coast.	0 57	20		Rathmullan, Ireland -	5 42	12½	9
Quicks Hole (S. side), U.S.	7 36	3½	3½	Ratna-ghiri, Hindoostan, W. Coast.	10 30	8	6½
—— (N. side) -	7 31	4½	3	Realejo, Cent. America	3 6	11	
Quilca River, Peru -	8 0	6		Reconlavi Inlet, Patagonia, W. Coast.	0 44	14	
Quilimane R. (entrance), Africa, E. Coast.	4 15	16		Red Bay, Ceylon, South Coast.	2 20	2½	
Quillebœuf, France -	10 6	9½	7½	—— (Pier), Ireland	10 31	4	4
Quiloa, Africa, E. Coast	4 45	12		—— Labrador -	7 45	3½	1½
Quoile Quay, Strangford, Ireland.	12 45	11	2½	—— Id., Durian Strait -	5 0	10½	
Rabat, Africa, W. Coast	1 46	9-12		Redbridge, England -	{ 10 42 } { 12 57 }	8½	6
Race, Cape, Newfoundland.	7 0	6½	5	Refuge Cove, Bass Strait	12 5	8	
Rachada Cape, Malacca Strait.	5 30	13		Régneville, France -	6 20	35	26
				Reikiavik, Iceland -	5 0	17½	13½
				Rendezvous Id., Borneo, S.W. Coast.		8	

* From a French survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Rendezvous, Strait of Georgia.	7 0	14		Roodewall Bay, Africa, S.W. Coast.	2 30	6½	
Rendsborg, Denmark -	7 42	4		Roque, Cape St., Brazils		10	8
Renfrew, R. Clyde, Scotland -	1 15	9		Roscoff, France - - -	4 40	23	17½
Resolution B., Marquesas	2 30	4		Rosel, Jersey, English Channel.	6 15	30	21½
Port, Tanna Id.	5 35	3		Roshnoff Cape, America, N.W. Coast.	7 30	15	
Reunion Id., { (St. Pierre)	noon.	3½		Rota, Spain - - -	1 24	12½	8
Indian O. { (St. Denis)	0 22	2½		Rotterdam, Netherlands	3 45	7	
Reunion Id., { (St. Gilles)	1 0	2½		Rottneft Id., Australia, W. Coast.	7 50	2½	
Indian O. { (St. Paul)	1 7	4		Rouen, France - - -	2 28		
Rewa Road, Fijii Islands. See Nukulan Port.				Rouge Harbour, Newfoundland.	7 0?	2-4?	
Rhio, Rhio Strait -	10 0	7	5	Roundstone, Ireland -	4 28	13½	10½
Ribble Lighthouse, England.	10 51	24	17	Rovama River, Africa, E. Coast.	4 0	16	11½
Richibucto R., Gulf St. Lawrence.	3 30	4	2½	Royal Harbour, Ruatan, Bay of Honduras.	7 45	3½	
Richmond, United States	4 28	3½	2½	Royal Island, Bahamas -	7 45	3½	
Island, U. S.	11 30	10½	9	Royalist Port, Palawan, E. C.	11 0?	6½?	
Harb., Prince Edward Island.	6 0	3	2	Royan, France - - -	3 38	13½	10
R., Australia, E. C.	9 20			Ruapuke Id. (Foveaux St.) New Zealand.	1 0	8	6
Rio de la Plata, Cape Castillos.*	8 30	2		Rugged Id., Bahamas -	8 0	3	
Buenos Ayres.	12 0	3-5		Nova Scotia	7 59	7½	6
Barragan Bay, S. America, E. C.	7 0	5-9		Ruggles B., Falkland Ids.	7 30	5	
Rio Grande do Sul, Brazil.		1½-2		Rupon, Hindoostan, W. Coast.	10 30	10	7
Rio Janeiro, Brazil -	3 0	4	3	Rush Port, Ireland -	6 8	5½	3½
Rio Negro, Patagonia, E. Coast.	11 0	14	10	Rutland Id., Ireland, W.C.	5 22	11	8
Rio Nunez, Africa, West Coast.	10 0	15	11½	Ryde, England - - -	11 20	13½	
Ristegouche R., Campbelltown, G. St. Lawrence.	4 0	10	7	Rye Bay, England -	11 20	22	17½
Rivadeo, Spain, N. Coast	3 0	15		Sabine Pass, G. of Mexico		1½	
Rivoli B., Australia, S.C.	10 0	4		Sable Cape (Clam Point), B. of Fundy.	8 27	8½	6½
Rocas, Atlantic - - -	5 15	10		(Clarkes Harb.), B. of Fundy.	8 58	11	9
Roche Cape, R. St. Lawrence.	9 30	6	4	Sable Island, N. side, Nova Scotia.	7 30	4	
Roche Harbour, Haro Strait.	irr.	12		Sable Island, S. side, Nova Scotia.	6 30	4	
Rochefort, France -	4 6	17	13	Sables d'Olonne, Les, France.	3 26	14	10
Rochelle, France - -	3 31	17	13	Sabon Id., Durian Strt. -		10	
Rockport, United States -	10 57	10½	8	Sacred Bay, Newfoundland	7 23	2½	
Rockall, N. Atlantic -	3 30	12		Sacrificios Prt., Mexico, W. Coast.	3 15	6	
Rocky Id., G. of Siam -	4 0	4		Saddle Id., East, China, E. Coast.	11 0	14	
Rodrigue Id., Ind. Ocean	1 45	6		Sado (Yebisu), Japan Sea	5 0	2	
Roebuck Bay, Australia, W. Coast.	0 30	30	18	Safety Cove, N.W. Coast of America.	1 0	14	11
Roji, Hindoostan, W.C.	1 40	18	14	Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8
Romania Point (Malay Penin.), China Sea, W. Coast.	10 30			Saguenay, Tadousac, G. St. Lawrence.	2 45	17	10
Romdals Ids., Norway -	10 45	6		Saigon (C. St. James) -	11 0	8	
Rona (South) Light, Scotland.	6 20	14½	10½				

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Saigon (Saigon City), Cochinchina.	5 30	9½		Sangwin R., Africa, W. Cst.	5 15	4	
Saintes, Caribbean Sea -	6 45			Sanmoon Bay (St. George Island), China, E. Coast.	10 20	15	
Saipan Id., Ladrone Ids.	6 45	2½		Sannana Bay, Moluccas		9	
Sal, Cape Verde Islands	7 45	5		San-shui, Si Kiang, China, E. Coast.		5-6	
Salango Id., Ecuador -	12 41	12		Santa Catalina Id., California.	9 35?	5?	4?
Salcombe, England -	5 41	15	11½	Santa Cruz R., Patagonia, E. Coast.	9 30	40	29
Saldanha B., Africa, W. C.	2 0	6		Santa Cruz or Agadir, Africa.	12 45	9	
Sale Macowa, Red Sea -	0 30	2		Santa Island, California	9 35?	5?	4?
Salem, United States -	11 13	10½	9	— Tenerife, Canary Is.	1 30	8	
Salm R., Africa, W. Cst.	8 10	6		Santa Maria Island, Chile	10 20	6	
Salmedina Rocks, Spain	1 27	12½	8	Santander, Spain -	3 30	15	12
Salomon Ids., S. Pacific	6 45	2		Santiago de Cuba, Cuba	8 33	2½	
Saltash, R. Tamar, England.	5 45	15	11	Santona, Spain -	3 30	12½	10½
Salt Cay Anchorage, Bahamas.	8 15	4	3	Saparooa Id., Moluccas -		6	
Saltees, St. George's Chan.	5 40			Sapie Bay, Sumbawa -	1 0	10	
Salvador, San, Port, Falkland Islands.	8 10	8		Sarawak R. (Moratabas entr.)	4 0	9	5½
Samanco B., Peru -	6 30	2		— Santubong (entr.)	4 0	10	6
Sambilangs, Malacca St.		12	10½	— Sarawak Junction	5 0	15-18	9
San Francisco (North Beach), California.	12 6	4½	3½	— City -	5 20	15-18	9
San Bartholomew Port, California.	9 10?	7-9?		Borneo, W. C.			
San Blas, Patagonia -	1 30	12	10	Sarn Badrig or the Causeway, Wales.	7 30	13	
— Mexico, W. C.	9 41	6½		Sarn-y-bwch Reef, Wales	7 40	14	
San Fernando, Trinidad -	4 38	5	3	Sau-o Bay, Formosa -	5 50	6	4½
San Juan (anchorage), California.	9 40?	5		Saugor Id., B. of Bengal		12	6-9
San Juan del Sur, Central America.	3 8?	10?		Saunarez Reef, Australia, E. Coast.	8 0	6	
— River, New Granada.	6 0	12		Savannah (city), U. S. -	8 13	7½	6½
San Lucar, Spain -	1 53	12½	8	— (entrance), U.S.	7 20	8	7
San Miguel, California -	9 25	5	4	Scales Point, Blackwater River, England.	12 0	14½	10
San Pedro Anchorage, California.	9 45	4½	3½	Scalloway, Shetland -	9 30	5½	4½
San Rosa Id., California	9 30?	5?	4?	Scapa, Orkneys -	9 5	10	7½
Sand Cay, United States	8 40	2	1	Scarborough, England -	4 11	15½	12½
Sandalwood Bay, Fijii Ids.	6 0	6?		— Shoal, Filipinas.	11 0	5	
Sand Point, G. of Liantung, Yellow Sea.	4 50	7	5½	Scarcies Rivers, Africa, W. Coast.	7 10	10	
Sands Pnt., United States	11 13	9	7½	Scarnish, Tiree Id., Scotland.	5 31	12	9
Sandwich Port, Malicollo Id., Banks Ids.	5 30	4		Schooner Retreat, N.W. Coast of America.	0 30	14	11
Sandy Cape, Australia, E. C.	7 50	6-8		Scilly (St. Agnes Id.) -	4 30	16	12
— Cove, E., B. of Fundy	10 33	21½	17½	— (St. Mary Id.), England.	4 18	15½	11½
— Cove, W., Bay of Fundy.	10 47	23	19	— Trescow -	4 22	16½	12½
— Hook, United States	7 29	5½	5	Sea Bear Bay, Patagonia, E. Coast.	12 45	20	
— Id., Madagascar, W. C.	5 0	15		Seaforth Loch, Athline, Scotland.	6 16	15	10
— Islet, Anstralia, W. C.	10 35	18		Seaham, England -	3 24	14½	10½
— Point Road, Magellan Strait.	12 0	5		Seal Cove, Grand Manan, B. of Fundy.	10 54	20	15
Sang-tau B., Yellow Sea	0 55	7	4½	Seal Id., C. Sable, Bay of Fundy.	9 49	12½	10½
Sanguanga (entrance) Ecuador.	4 10	9					
Sanguir Island, Moluccas		6					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Seamount Bay, Mulroy B., Ireland.	6 44	7½		Sharks Bay, Freycinet Estuary.	4 15	3½	
Sebastian, San, Brazil -	2 0	4		— Cape Perron	12 45	5½	
— Tierra del Fuego	7 0			— Hamelin Pool	5 0	3½	
— Spain, N. Coast	3 0	12	9	— Australia, N.W. Coast			
— B., Africa, S.C.	3 8	6		Shediac Harbour, New Brunswick.	{ 1 0 } 4	2	
Sedashigar Bay,* Hindoostan, W. Coast.	10 0	6½	5	— 8 0			
Sedili R., China Sea, W.C.	9 44	7		Sheephaven, Ireland -	5 32	11½	8½
Seer River, Hindoostan, W. Coast.	10 30	11		Sheerness, England -	0 37	16	13½
— Juggee -	1 30	6		Sheet Harb., Nova Scotia	8 6	6½	4½
Segoro Wedie Bay, Java	9 0	8	10	Shafeen Island, Africa, S.C.	4 40	12	
Sein, Isle de, France -	3 21	17½	12	Sheffield Island, U. States	10 58	8½	7½
Seleney Bay, Lapland -	7 9	9		Shelburne, Nova Scotia -	8 4	7	5½
Selsea Bill, England -	11 45	16½	12½	Sheldrake Island, Gulf St. Lawrence.	6 0	5	3
Semaphore Jetty, Gulf of St. Vincent.†	4 40	6½-8	5-5½	Sherbro R., Africa, W. Cst.	6 0	11	
Semiahmoo Bay, Gulf of Georgia, America, N.W. Coast.	2 0	12		Shields, North, England	3 23	13½	10
Senegal (Bar) -	8 42	6		Shihtau Bay, Yellow Sea	1 30	9	7
— (Guet N'dar) -	8 42	6		Ship Harb., Nova Scotia (New Id.),	7 54	6½	4½
— (St. Louis), Africa, W. Coast.	10 0	6		Falkland Islands.	10 30		
Serraia, Hindoostan, W.C.	1 0	16	13	Shippigan, Gulf St. Lawrence.	3 42	5½	3
Serrana Bank, Mosquito C.		2		Shoal Bay, Australia, N.C.	6 0	18-25	14-20
Serranilla Bank, Mosquito Coast.	irr.	2		— E. Coast -	8 30		
Sesham Islands, Hang-chu Bay, China, E. Coast.	11 45	14		Shoal Water B., Australia, E. Coast.	10 30	12-18	
Setubal, Portugal -	2 30	8	11½	Shoreham, England -	11 34	18	13½
Seudre, R., (entr.), France	3 31	15		Shushartie B., Vancouver I.		12	
Seychelle Archip. (Mayhé Id., Indian Ocean).	4 0	6½		Si Kiang or West River, China, E. Coast:			
Seymour Narrows, British Columbia.	4 0	11		— (San-shui) -			5-6
Seypan Id., see Saipan.				— (Shao-king) -			3
Seven Islands, Lapland -	8-20	12	5	— (Wuchan) -			1-1½
— Bay, Gulf St. Lawrence.	1 40	9		Siak River, Malacca Strt. off the town -	9 0	12	
Sha-lui-tien Banks (west part), Yellow Sea.	2 50	10	8	Sidmouth Cape, Australia, E. Coast.	9 15	10	
Shab Kadún, Arabia, S.E. Coast.	9 20	10		Sierra Leone, Africa, W.C.	7 55	8	
Shab'bu-saifeh, Arabia, S.E. Coast.	9 45	10		Sillebar R. (Bar), Sumatra	6 0	4½	
Shalbet Island, Hindoostan, W. Coast.	12 0	9	7	Simidsu, Japan Sea -	7 30	7	
Shallow Harb., Falkland Ids.	9 30	6		Simoda Port, Japan Sea	5 0	3-5	
Shanghai, Yang-tse-Kiang, China, E. Coast.	0 40	10	7	Simonoseki, Japan Sea -	8 30	8	6
Shao-king, Si Kiang, China, E. Coast.		3		Simons Bay, Africa -	2 44	5½	3½
Sharja, Persian Gulf -	1 0	6		Simons St., Island, U.S.	7 43	8½	6½
Sharks Bay, Naturaliste Channel.	11 45	6		Simpson Port, N.W. Coast of America.	0 35	21½	14½
— Denham Sd.	12 5	5		Singapore, New Harbour, Malacca Strait.	9 45	10	7½
— Freycinet Reach.	3 0	5		Singoteer Mata, Hindoostan, W. Coast.	5 20	24	
				Sinou, Africa, W. Coast -	5 0	4	
				Sir C. Hardy Ids., Torres Strait, E. Coast.	9 15	10	
				Sir E. Pellew Islands, Australia, N. Coast.	7 30	4-7	
				Sisal, Gulf of Mexico -		2	
				Sitka, America, N.W. Coast.†	0 34	5-7	

* Spring tides rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

† See Note, page 175.

rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not set, but on the authority of Commander Pike, H.M.S. Devastation, (1862,) the local pilots say it sometimes is as much as 16 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Skaapen Fiord, Færø Islands :				South Rock, Ireland -	10 58	13	10½
Between Stormoe and Sandoe.	5 0	9½	7½	Southampton, England -	{ 10 30 12 45 }	13	9½
Between Hestoe and Sandoe.	5 30	9½	7½	South West Bay, New Providence.	7 30	4	
Skagen or the Skaw, Jutland.	5 56	1		Cape, N. Zealand	12 0	7	5
Skerry, Great, E. side, Pentland Firth.	11 4	7¾	6½	Southernness, England -	11 20	28	
Skerry, Great, W. side, Pentland Firth.	10 53			Southwold, England -	10 20	6½	4½
Skerries, Ireland, N. Cst.	6 15	5	3	Spain, Port of, Trinidad -	4 30	4	2½
Skerries, E. Coast. -	11 0	13	10	Spaniards Bay, Newfoundland.	7 45	4½	3
Skidegate Inlet, N.W. Coast of America.	1 0	17	14	Spencer Bay, Africa, W. Coast.	10 50	5-6	
Skip Ness, Scotland -	11 50	9		Spensers Anchorage, Bay of Fundy.	11 42	39	33
Skull, Ireland - -	4 2	9½	7½	B., Africa, S.W.C.	10 50	5-6	
Slaughden, Orford, England.	1 0	7½		Spenser Gulf, (Thorny Passage,) Australia, S.C.	12 0	6-8	
Slievebane Bay Ireland, W. Coast.	5 49	10½	7¾	Point Lowly -	7 0	6-8	
Sligo Bay (Mullaghmore) Ireland.	5 18	11½	8½	Port Augusta* -	8 30	9-12	
Harbour, Ireland	5 23	11½	8½	Point Riley -	5 45	4½	
Slyne Hd., Ireland, W.C.	4 30	13½	10	Wallaroo -	irr.	4-5	
Smalls Lighthouse, St. Georges Channel.	6 0	21		Sphax Roads, Mediterranean.	4 30	5	3
Smerwick, Ireland -	3 50	11½	8	Spicers Cove, B. of Fundy	11 35	37	30½
Smith Sound, Newfoundland.	7 8	3½	2½	Spider Id., China, E. C. -	10 0	17	
Smithville, United States	7 19	5½	4½	Spitzbergen (Bell Sound)	8 56	3½	
Smoky Bay, Australia, S. Coast.	12 15	6		Danes Sound	0 24	5½	
Smyth Harbour, Tierra del Fuego.	12	6½		Spurn Pt. (Humber R.), England.	5 26	18½	15
Snape Bridge, Orford, England.	3 0	6		Staten Island, Tierra del Fuego.	4 30	8	
Socoa, France - -	3 19	12½	8¾	Staunton Id., Yellow Sea	1 30	8	5½
Society Bay (Sullivan Bay), Yellow Sea.	0 15	8		Steilacoom Fort, Oregon	4 46	11	9½
Socotra Id., Indian Ocean	7 20	8		Stephen Port, Australia, E. Coast.	9 0	6	
Sofala R., Africa, E. Coast	4 0	19		Falkland Islands.	7 45	7½	
Solitary Ids., Australia, E. Coast.	9 15	5	3	Stewart Harbour, Tierra del Fuego.	2 50	4	
Solomon Ids., Indian Ocean	1 30	5		Stirling, Firth of Forth, Scotland.	3 52	7½	4½
Solovet Road, White Sea	5 0	4		Stirrup Cays, Bahamas -	7 0	4	
Solway (Tarn Point), Scotland.	11 22	23	18	Stockton (Tees), England	4 40	11	
Sooke Harbour, Vancouver Island.	2 0	8		Stonefield (Loch Etive), Scotland.	7 3		
Soonmianee Harbour, Persian Gulf.	9 0	9?		Stonehaven, Scotland -	1 10	14	11
Sosnovaia Bay, White Sea	2 40	6		Stonington, United States	9 7	3½	3
Sosnovets, White Sea -	11 44	18		Stornoway, Lewis Island, Scotland.	6 46	13	9½
Souma, White Sea -	6 30	5½		Strangford (Killard Point), Ireland.	10 53	14	11½
Sourabaya Strait, Java -	irr.	4-6		Quay - -	12 31	10½	8½
Jansen Channel.	irr.	8½		Head of Lough (Turley Rocks).	12 44	11½	9½
South Farallon, California	10 37	4½	3½	Streaky Bay (Blancheport), Australia S. C.	1 0	5	
				Stroma, S. side, Pentland Firth.	9 47	7½	6
				Stromness, Orkneys -	9 0	10	7½

* At Port Augusta, when the winds veers round to West and South, and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Stuart Channel (Oyster Harbour).	h. m. 6 0	ft. 10	ft.	Takush Harbour, British Columbia.	h. m. 1 0	ft. 14	ft. 9
— Cowitchin Harb., Vancouver Id.		10-12		Talcahuano, Chile -	10 14	5	
Stuart Island, Strait of Georgia.	6 0	12-14		Talcan Island, Patagonia, W. Coast.	1 3	15½	
Sturge Narrows, Strait of Georgia.	6 0	12		Tailung Channel, Canton River, China.	1 30	6½	
Suadiva Atoll, Maldives	1 0	4		Ta-lien-whan Bay, Yellow Sea.	10 47	10½	8
Sual Port, Luzon - -		6		Tama no Ura Harbour, Goto Id., Japan Sea.		6-8	4-6
Suderoe Fiord, Færoe Ids.	6 0	9½	7½	Tam-Sui Harbour, China Sea, E. Coast.	11 45	7-10	
Suez Bay (head of Gulf), Red Sea.	2 0	6		Tamar R., George Town, Tasmania.	12 5	10	7½
Sughrá, Arabia, S.E. Cst.	8 0	6		Tamar R., Launceston, Tasmania.	1 0	12½	
Sumburgh Head, Shetland	9 45	5		— Port, Magellan Strait.	3 5	5	
Sunday or Raoul Island, S. Pacific.	6 0			Tamatave, Madagascar, E. Coast.	4 18	8	
Sunderland, England -	3 22	14½	11	Tampa Bay, United States	11 21	1½	1½
— N., England -	2 30	15	11½	Tanabé, Ki Channel, Japan Sea.	6 0	6	5½
Supé Bay, Peru - -	4 50	3		Tanera, Summer Islands, Scotland.	6 37	14	10½
Surat (entrance), Hindoostan, W. Coast.	2 45	19	15	Tangier, Africa, N. Coast	1 42	8	
— (town), Hindoostan, W. Coast.	4 0	19		Tangtang Harbour, Madagascar, E. Coast.	4 30	6	
Surin, St., France - -	4 11	14½	11	Tanjong Api, China Sea		7	
Surinam, Guayana -	6 0	5½		Tanjong Bolus, Malacca Strait.	9 30	10½	8½
Sussex Port, Falkland Ids.	8 15	6		Tanna, New Hebrides -	5 35	3	
Sutton Pool, England -	5 32	15½	11½	Tappahannock, U. States	0 42	2	1½
Sviatoi Nos, Lapland -	9 15	14		Tappanoeely Harbour, Sumatra.	6 10	6	
Svineoe Fiord, Færoe Ids.	12 0	6½	4½	Taranaki or New Plymouth, New Zealand.	9 30	12	9
Swain Reefs, Australia, E.C.	10 25	10		Tarbert, Ireland - -	4 57	14½	10½
Swan Id., Bass Strait -	9 35	6		Tarifa, Spain - -	1 46	6	3½
— Point, Australia, W. Coast.	0 10	26		Tarn Pt., Solway, Scotland.	11 22	23	18
Swan River, Gage Road	8 50	2½		Tarpaulin Cove, United States.	8 4	2½	2½
— Port Grey, Australia, W. Coast.	9 0	1-1½		Tarrytown, United States	9 57	4	3½
Swansea, (Mumbles Lighthouse), Wales.	6 1	27½	20½	Taské, Japan Sea -	9 44	8½	1½?
Swatan, China, E. Coast	3 0	9		Tatamagouche, Nova Scotia.	10 0	8	5
Swift Bay, Australia, N. Coast.	12 0	18		Tatiyama Bay, Japan Sea	5 50	5	
Swona, E. side, Pentland Firth.	10 24	10	7½	Tauranga Harbour, New Zealand.	7 10	6	4½
— W. side, Pentland Firth.	9 35	10	7	Tavoy R., (entrance) Bay of Bengal, E. Coast.	10 30	20	
Sydney, Australia, E. Cst.	8 38	4½	4	Tay River (Bar), Scotland.	2 6	16	14
Sydney Harb., Cape Breton	9 0	5	4	Tay-bay-oo-bay, China Sea, E. Coast.	10 15	6	
Ta-tsing ho Yellow Sea -	4 10	10½	8	Tebonkos Road, Baly. (N. Coast.)	5 0	6½	
Table Bay, Africa, W. Cst.	2 40	5		Teelin Harb., Ireland -	5 16	11½	8½
Taboga, New Granada -	4 0	14		Tees R. (Bar), England	3 45	15	12½
Tabou R., Africa, W. Cst.	4 45	3-4					
Tabuai Island, S. Pacific		3					
Tadeo, San, River, Patagonia, W. Coast.	11 45	6					
Tahiti, S. Pacific -	noon.	1½					
Tahrí, Persian Gulf -	5 0?						
Tai-cho ho, Yellow Sea -	0 15	6					
Taichow Ids., China, E. C.	9 0	14					
Tai-Tai Bay, China Sea, E. Coast.	9 30	5½					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Teignmouth, England -	6 0	13	9½	Torta Bay, Africa, W. C.	3 30	3	
Tellicherry, Hindoostan, W. Coast.	11 40	5	4	Tortola, Virgin Islands -	8 30	1½	
Tenby, Wales -	5 42	27	20	Tortugas, Florida, U. S.	9 56	1½	1
Tener Cape Verdife, Ids., (Santa Cruz).		8½	6	Tova or Na Vatu Reef, S. Pacific.	6 8	4	
Terceira, Azores -	12 32	4½		Towan Id., China, E. C.	9 20	13	
Teriberka R., Lapland -	7 20	12		Tower Id., Galapagos -	?	?	
Teremakau River, New Zealand.	9 55	9		Townshend Harb., Tierra del Fuego.	2 30	5	
Terschelling (West), Netherlands.	8 40	6	5	Townshend Port, Oregon	3 49	5½	5
Tetrina, White Sea -	3 17	7		Tracadie, Prince Edward Island.	7 0	3½	2
Tetuan, Africa, N. Coast	2 23	2½	1½	Tracey Harbour, British Columbia.	12 0	16	11½
Texel (outside Shoals), Netherlands.	6 30	4	3½	Tracy Island, Korea, S. Coast.	8 58	11½	8½
Thirsty Sound, Australia, E. Coast.	10 45	12-18		Træ Islands, Norway -	11 45	7	
Thomas St., Id., Africa -	3 25	4½		Trawbreaga Lough, Ire- land.	6 10	11½	8½
Thompson Id., New Zea- land.	11 30	8	6	Tréguier, France -	5 32	25	18½
Thorny Passage, Spencer Gulf, Australia, S. C.	12 0	6-8		Trek Island, White Sea -	10 48	20	
Thorsminde, Jutland -	3 34	2		Trepassey, Newfoundland	7 0	6½	5
Three Hummock Island (E. side), Bass Strait.	10 30	10		Tréport, France -	11 9	27	21
Three Kings Islands, New Zealand.	8 0	7		Tres Cruces Point, Pata- gonia, W. Coast.	1 15	16	
Three Points Cape, Africa, W. Coast.	4 0	4		Triangles, Gulf of Mexico		1½	
Three Rivers, River St. Lawrence.	11 30	1		Trieste, Adriatic -	9 35	3½	
Throgs Point, U. S. -	11 20	9½	7½	Trincomalie Har., Ceylon, S. Coast.	8 18	2	1½
Thurso, Scotland -	8 28	13½	9½	Tringano R., G. of Siam, China Sea, W. Coast.	8 0		
Ticao Island, (Port San Jacinto) Filipinas.	6 30	6		Trinidad (Port Spain), Caribbee Islands.	4 30	4	3
Tictoc Bay, Patagonia -	1 45	11		Trinity Bay (Bull Id.) Newfoundland.	7 22	3½	2
Tien-pak Harb., China, East Coast.	12 0	8½		—— Harbour, New- foundland.	7 10	3½	2
Timballier Bay, G. of Mexico.	irr.	2		—— Opening, Great Barrier Reefs.	9 15	7-12	
Tinghae, Chusan, China, E. Coast.	11 0	12	9	Tripoli (Syria), Mediter- ranean.	10 20	2	
Tobago, Caribbean Sea -	3 0	4	2	Tristan da Cunha, South Atlantic.		8	
Tobermory, Isle of Mull	5 36	13	9½	Triton Bay, New Guinea	1 8	7	1
Toboe Ali Point, Banka { Strait.	8 30PM* 10 0AM†	12		—— Harb., Newfound- land.	7 0?	2-4?	
Tomo (Seto-uchi), Japan Sea.	11 0?		5	Tromsø, Norway -	1 45	8	
Tongatabu, S. Pacific -	6 50	6		Troon, Scotland -	11 50	10	7½
Tongsang Harb., China, E. Coast.	11 30	12		Troubridge Shoals, Aus- tralia S. Coast.	3 30	6	
Tonning, Germany -	2 1	9		Truro (Quay), England	5 5	10	6
Toona, Gulf of Kutch, Hindoostan.	1 50	16	13	Tsang chow Id., Bias Bay, China, E. Coast.	8 30		
Tooniang Id., Bias Bay, China, E. Coast.	8 0			Tsau-liang-hai or Chosan Harb., Japan Sea.	7 45	7	5
Topaze Harbour, British Columbia.	3 0	16	11½	Tsu-sima Sound, Japan Sea.	8 30	8	6
Torbay, England -	6 0	13½	10	Tsugar Strait, Japan Sea	5 0	5	
Toro Point Chile -	9 45			Tudri River (bar), Hin- doostan, W. Coast.	10 0	6½	5½
				Tudwall, St., Road, Wales	7 45	14	

* In S.E. monsoon.

† In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tamaco Road, Ecuador -	2 33	12		Valery St. en-Caux, France	10 46	27	21½
Tunis, Mediterranean -		3		----- sur-Somme,	11 46	27	21½
Turks Islands, Bahamas		3		France.			
Turna Bay, White Sea -	9 54	11		Vallay, North Uist, Scot-	6 10	11½	8½
Turner C., Prince Edwd.	6 10	4	2	land, W. Coast.			
Island.				Vallenar R., Patagonia,	0 18	5	
Turon B., Cochin China	3 0	4		W. Coast.			
Turtle Island (North),	11 0	18		Valparaiso, Chile -	9 32	5	
Australia, W. Coast.				Vanderlin Island, Aus-	9 30	7	4
----- S. Pacific	6 11	4		tralia, N. Coast.			
Tuticorin Harb., G. of	1 15	2½	1½	Vansittart Bay, Australia,	9 15	6	
Manar, Bay of Bengal,				N.W. Coast.			
W. Coast.				Vansittarts Saddle, Yel-	4 20	10	8½
Tutukaka Harbour, New	7 0	9	7	low Sea.			
Zealand.				Vao Port. See Alcmène,	8 6	4	
Tweed River (Danger	9 45	5-8		New Caledonia.			
Point), Australia E.C.				Vatoa or Turtle Island,	6 11	4	
Twofold B., Australia, E.C.	10 0	7	5	S. Pacific.			
Tylatiap Harb. Java, S.C.	8 45	3½		Vavu, South Pacific -	6 20	5	
Tynemouth (Bar), England	3 20	14½	11½	Veere, Netherlands -	1 20	15	
Tyssen Id., Falkland Ids.	8 0	6		Ventry, Ireland -	3 44	10½	7½
Tytando Inlet, Java -	6 30	5	3½	Venus Harbour, Austra-	2 15	6	
Typa Anchorage, China,	10 0	7		lia, S. Coast.			
E. Coast.				Vera Cruz, G. of Mexico		2	
Uinne, New Caledonia -	6 48	4½		Vermilion Bay, G. of	irr.	2½	1½
Uist North (Kallin), Scot-	5 59	13½	9½	Mexico.			
land, W. Coast.				Vernon Chan. (Chusan	9 40	14	
----- (Vallay), Scot-	6 10	11½	8½	Arch), China, E. Coast			
land, W. Coast.				Versovah, Hindoostan,	12 0	16	13
----- South, (Loch Bois-	5 47	12½	9½	W. Coast.			
dale), Scotland, W. C.				Verte Bay, Nova Scotia	10 0	9	5
Ullapool, Loch Broom,	6 40	14½	10½	Victoria Port, Brazil -	3 0	4	
Scotland.				----- Australia,	2 40	5	
Ummen Nakheilah, Per-	7 30?	8?		S. Coast.			
sian Gulf.				----- St. Juan de Fuca	irr.	7-10	5-8
Underwood Port, New	6 10	8	6	Strait.			
Zealand.				Victoria River, Holdfast	9 0	16	10
Ungava, Hudson Bay* -		67		Reach, Australia, N.W.			
Union Bay, La Plata -	3 10	12	9	Coast.			
Union, Port la, G. of	3 15	10½	8½	----- Mosquito	12 19	15-24	
Fonseca, Cent. America.				Flat, Australia, N.W.			
Unsang, Borneo -	8 0	3½		Coast.			
Upervivik, Greenland -	11 0	8		----- Sandy Id.,	1 17	3-10	
Upstart Bay, Australia,	9 0	6		Australia, N.W. Coast.			
E. Coast.				----- Turtle Pt.,	7 15	7-13	
Urakami, Japan Sea -	7 30	6	5	Australia, N.W. Coast.			
Uranouchi, Japan Sea -			5	Vigo, Spain - - -	3 0	12-13	
Urie Firth, Shetlands -	9 45	6½	5	Vila Harb., Sandwich	5 0	5	
Ursula Id., Palawan, China	11 0	7½		Id., Banks Ids.			
Sea, E. Coast.				Vin Harbour, G. St. Law-	5 45	5	3
Usborne Port, Australia,	1 45	34		rence.			
W. Coast.				Vincent, St., Cape, Mada-	4 45	12	
Ushant, France - - -	3 32	19½	13½	gascar, W. Coast.			
Ushruffi Islands, Red Sea	6 14	2		----- Caribbean Sea	3 0	1½	1
Utria, New Granada -	4 0	12		----- Port St., New	5 50	4½	
Værö, Norway - - -	12 0	9	7½	Caledonia.			
Valdivia Port, Chile -	10 35	5		Vingorla, Hindoostan, W.	11 0	8	6½
Valentia Harb., Ireland -	3 42	11	8	Coast.			
Valentine Harb., Magellan	2 0			Virgin C., Magellan	8 30	36-42	
Strait.				Strait.			
				Vivero, Spain, N. Coast -	3 0	15	ft.

* See Note, page 164.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.			h. m.	ft.	ft.
Viziadroog. See Geriah.				Waterford (Bridge), Ire-	6 6	13½	10½
Vladimir, St., Bay, G. of	irr.	2		land.			
Tartary.				Waterford (Duncannon	5 20	12½	10
Volcano Ids., China, E.	11 30	15	7½	Fort).			
Coast.				Waterloo Bay, Africa, S.	4 0	6	
Voronov C., White Sea -	11 20	17		Coast.			
Waagoe Fiord, Færoe	6 0	9½	7½	Webeck - - -	6 21	7	4
Ids.				Webling Point, Spencer	6 10	6-9	
Waddington Harb., Bute	6 0	13		Gulf, Australia, S. C.			
Inlet, B. Columbia.				Week Islands, Tierra del	2 0	5	
Wahaay Harb. (Ceram),	6 0	3-4		Fuego.			
N. Coast, Moluccas.				Wei-hai or Kyan-chau	5 0	12	9
Waikato R., New Zea-	9 30	12	9	Bay, Yellow Sea.			
land.				Wei-hai-wei Harbour,	9 30	9	
Wairoa River, New Zea-	6 45	7	4	Yellow Sea.			
land.				Weir Head, R. Tamar,	6 17	5½	1½
Wakaya Id., Fijii Ids. -	6 0	4	3	England.			
Wakefield Port, Aus-	5 0	9		Welcome B., Patagonia,	0 50	7½	
tralia, S. Coast.				W. Coast.			
Walker Creek, Choiseul	6 20	5½		Wellesley Is., Australia,	7 30	8-12	
Id., Falkland Ids.				N. Coast.			
——, R. Tyne, Eng-		10½		Wellfleet, United States	11 5	13½	12
land.				Wells, England -	7 0	12	
Wallace Har., Nova Scotia	10 30	8	5	—— Bar, England -	6 20	18	
Wallis Id., Torres Strait	irr.	7		Wenman Isles, Galapagos	2 10		
Walton Bay, England -	7 3	39½	22½	Weser (outer light vessel),	11 30		
Walvisch Bay, Africa,	1 54	6		Germany.			
W. Coast.				West Cove, Kenmare R.,	3 52	10	7½
Wanchu R. (entrance),	9 0	15½		Ireland.			
China, E. Coast.				—— Gat, Netherlands -	1 45	7	
—— (City), China,	9 30	15½		—— Hill, Australia, E. C.	10 20	24	
E. Coast.				West Quoddy, B. of Fundy	11 12	21	17
Wang-kia Bay, Yellow S.	2 30	9	7	West River, China, E.			
Wang-kia-tia Bay, Yel-	6 0	12	9	Coast, see Si Kiang.			
low Sea.				Western Port, Australia,	0 12	8½	6½
Wanganui R., New Zea-	10 15	8	6	Muscle Rock.			
land.				——	1 13	10½	8½
—— Inlet, New Zea-	11 20	7	6	Bourchier Channel.			
land.				——	1 0	10	8
Wangari Harbour, New	7 0	9	7	French Id. (Spit).			
Zealand.				Westmanshaven, Færoe	8 0	9½	7½
Wangaroa Harbour, New	8 15	7		Ids.			
Zealand.				Westness, Orkneys -	9 11	10	7½
Wangaruru Harbour, New	7 10	9	7	Weston-super-mare, Eng-	6 54	37	28½
Zealand.				land.			
Wapitagan Harb., G. of	10 30	5	3	Westport, Ireland -	4 57	12½	9½
St. Lawrence.				Wexford, Ireland -	7 21	5	3½
Waree River, Hindoo-	9 40	8		Whaingaroa Harbour,	9 50	12	
stan, W. Coast.				New Zealand.			
Warleigh Quay, River	5 47	14½	10½	Whampoa { In March -	1 40	} 7-8	
Tavy, England.				(Docks), { In April -	1 15		
Warnboro' Sd., Australia,		3-4		China { In May & June	0 30		
W. Coast.				See foot note, p. 169.			
Warrenpoint, Carling-	11 10	14½	12	Whitby, England -	3 45	15	11½
ford, Ireland.				White Dog Ids., China, E. C.	9 0	18	
—— Lough Foyle,	6 20	6½	5	Whitehaven, England -	11 14	23½	18½
Ireland.				—— Nova Scotia	8 0	6½	4½
Warsheek Roads, Africa,	4 30	8		Wick, Scotland - -	11 22	10	7½
E. Coast.				Wicklow, Ireland - -	10 29	9	6½
Watch Hill, United States	9 0	3	2½	Wide Bay, Australia, E. C.	9 14	10	7

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Widewall, Orkneys -	9 3	10	7½	Wusung River (Pheasant Point).	0 35	13	8
Wigton, Scotland -	11 30			Wynkoops Bay, Java -	5 0	4½	4
Wilberforce Cape, Australia, N. Coast.	8 10	10		Yafa, Mediterranean -	10 0	1½	
Wild Wave Bay, Loo Choo Islands.	8 0	8		Yang ho, Yellow Sea -	0 15	6	
William Prt., Falkland Ids.	5 15	7	5½	Yang-tse Kiang (Light Ship at entrance), China, E. Coast.	12 0	15	10
— New Zealand	12 45	8	6	Yarmouth Haven (Brush), England.		5½	4½
— Scotland, W.C.	11 10	18	10	— Bay of Fundy	10 9	16	13
Willis Islets, Australia, E. Coast.	8 0	6		— Bridge, England		5	4
Willoughby Cape, Kangaroo Id., Australia.	4 10	6		— Road, England	9 15	6	4½
Wilmington, United States	9 6	3	2½	— Isle of Wight, England.	{ 10 0 } { 12 0 }	7	6½
Wilson Promontory, Australia, S. Coast.	2 0	10		Yealm River, Bigbury Bay, England.	5 37	16½	11½
Winter Harb., Melville Id.	1 30	3½		Yedo Bay, (Yoku-hama) Japan.	6 0	6½	4½
Winterton Ness, England	8 25	7½	6½	Yellaboi, Africa, West C.	7 10	10	
Wisbeach, England -	7 30	15		Yeu, Ile d', France -	3 6	14½	10
Wisbeach Eye, England		20		Ylo Road, Peru -	8 15	6	
Wivenhoe, Colne River, England.	12 10	15	10	Yoku-hama, Yedo Bay, Japan Sea.	6 0	6½	4½
Wolstenholm Sound, Arctic Regions.	11 8	7½		York C., Australia, East Coast.	11 15	10	7
Woodbridge or Bawdsey Haven (Bar), England.	11 45	12	9	— Factory, Hudson Bay	11 15	10-14	
— (Kingston Quay), England.	0 35	10		— River (Moody's Wharf), United States.	9 35	3½	
Woodbridge, (Wilford Bridge), England.	0 55	7		— Road, Magellan St.	2 0	9	
Woodlark Id., Louisiade Archip.	7 15	4		— Harb., Newfoundland.	10 37	5½?	
Woods Hole (entrance from Vineyard Sound), United States.	8 34	2	1½	Youghal, Ireland -	5 14	12½	10
— (entrance from Buzzard Bay), United States.	7 59	4½	4	Ythan River, Scotland -	9. 5	2½	
Woody Island, Australia, E. Coast.	9 14	10	7	Yu-lin-kan Bay, China Sea.	11 20	12½	
Woolwich, England -	1 37	18½	15½	Yung R., Chinhae, China, E. Coast.	1 0	9	
Workington, England -	11 4	20	15	— Ning-po-fu, China, E. Coast.	5 20	2½	
Wrabness, Stour River, England.	12 29	12		Yung-hing Bay, Japan S.	6 5	6½	
Wranger Oog, Germany	12 0	9?		Yura Harbour, Japan Sea	4 30	12-15	
Wrath Cape, Scotland -	7 30	15½		Zambesi River (Pearl Id.), Africa, E. Coast.	5 0	4½	
Wreck Bay, Loyalty Ids.	6 30	5-6		Zand Bay, Java -	5 20	10	
Wreck Reef, (Bird Islet) Australia, E. Coast.	8 3	6		Zanzibar, Africa, E.C. -	4 15	11	
Wuchu, Si Kiang, China, East Coast.		1-1½		— (Channel), Africa, E. Coast.	4 10	12	
Wusung River (entrance), Yang-tse-Kiang, China, E. Coast.	0 30	15	10½	Zaudzi, Mayotta, Comoro Ids.	12 0	7	
				Zebu Port, Filipinas -	7 15	8½	
				Zeyla, Africa, E. Coast	2 0	11	9
				Zieriksee, Netherlands -		4-5	3
				Zoolla, Red Sea -			

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